# THE ENGINEERING AND MINING JOURNAL.

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## New Method of Roasting Sulphurets.

THE very numerous plans and machines in use for reducing refractory gold, silver, and copper ores, are generally open to one of the following objections: Either they fail to accomplish the work required, or they make it cost too much for low-grade ores.

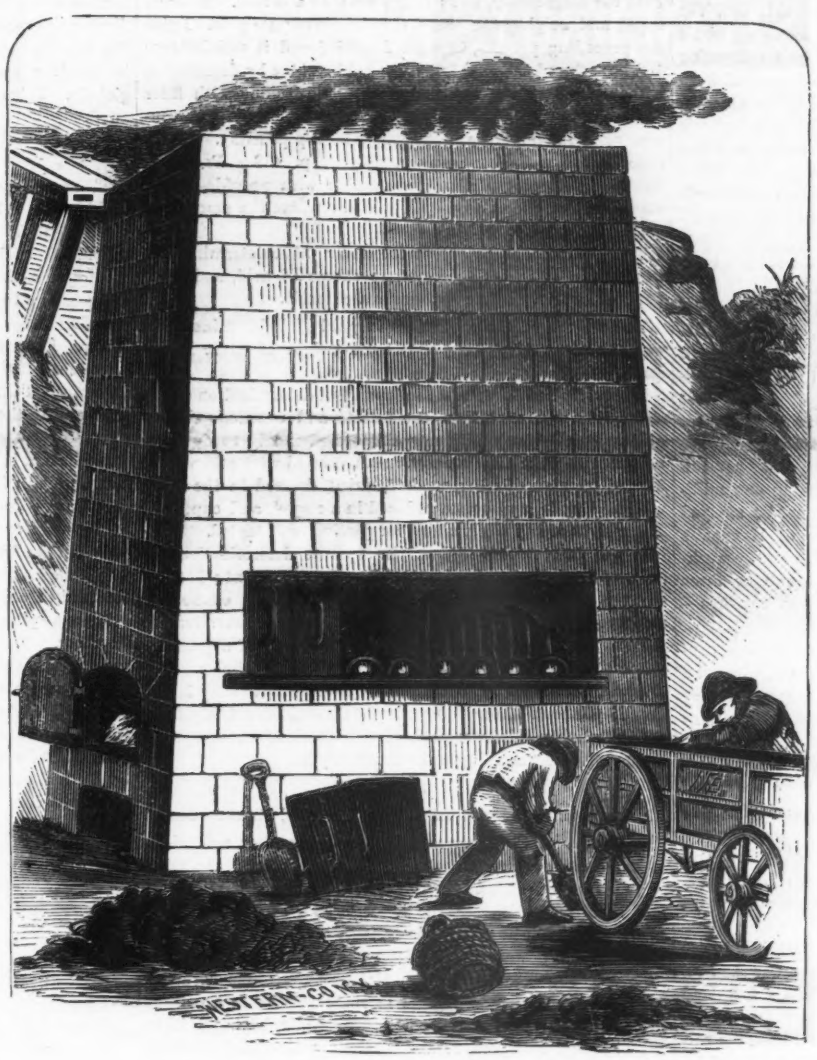
This is more especially true of modes and apparatus for treating pulverized ores, as, in that form, they are impervious to heated currents, and require their surface to be often changed by stirring. It is clear that any system of roasting by which the surface of the mass is only or mainly acted upon, must be wasteful of fuel and labor. The reverberatory represents this class and its faults. Other efficient means of desulphurizing have lately been introduced which avoid, in part, this waste of labor and fuel; but they are only applicable to certain classes of ore, and involve costly and delicate apparatus.

The accompanying cut illustrates a process for roasting pulverized ores, invented by Captain F. W. CROSBY, Superintendent of the North Barrier Gold Mines, Cabarras county, N. C., and now employed by him at those mines, in the treatment of concentrations, and other heavy sulphurets. This process is designed and claimed to give the best results, at very moderate cost, by rendering the charge so porous that all parts are brought into direct contact with the agents of combustion.

The illustration gives a tolerably clear notion of the furnace, which is named after a partner of Captain CROSBY, in order to distinguish it from another and totally different invention, already bearing the name of CROSBY. It consists of an upright shaft, in which round iron bars are placed vertically, occupying about one-tenth of its sectional area. The lower ends of these bars or rods connect with the openings of flues or passages leading from the fire-chamber. They are intended to be withdrawn after the furnace is filled with ore, so as to secure passages for the air and flame. This object is still further sought by the employment of fibrous vegetable material, mixed in the ore, which leaves, after combustion, innumerable small passages ramifying through the whole mass.

The method of treatment by this process is substantially as follows: The pulverized ore, or tailings, is dampened to about the consistency of moulding sand, and cut straw, hay, or other vegetable fibre, is then mixed with it, at the rate of 5 to 10 pounds per ton of ore. Salt, or other chemicals may be added, if required. The flue-rods being placed in position, and the doors closed, the furnace is filled by shovelling the ore in at the top. The mass is left for a few hours to set; the rods are then withdrawn; and firing commences. The holes thus made vertically through the charge are flues, and, though small, their number insures all needful draught. As the work proceeds, the draught is regulated by closing the flues, where it is excessive. As the mass becomes heated, the straw burns out, leaving myriads of other and smaller flues for heat to enter and gas to escape; so that, after the first few hours, the flame and heat are escaping through every cubic inch of the charge, thus insuring thorough reduction and unusual economy of fuel. The furnace here illustrated may be built in form and material to suit different localities. The one now in operation at North Barrier is composed wholly of rough stone, laid in clay mortar.

The illustration shows also the manner in which, after roasting, the ore is removed through working doors in the furnace wall. It has been found in practice with auriferous sulphurets of iron, such as occur at the North Carolina mines, that there is no difficulty in this part of the operation. The material has not been found to sinter or cake in the furnace; and ores which have a tendency to do so may, it is claimed, be prevented by suitable admixture of sand beforehand. The patent for this invention covers the use of the rods, and the admixture of combustible fibre. For further information, address Captain CROSBY, as above.



*THE BALLARD ROASTING FURNACE.*

## The Silver Mines of Nevada.

Abstract of a paper read before the New York Liberal Club, by Captain C. B. DAHLGREN.

NEVADA, the silver State, was admitted into the Union as the thirty-sixth State. It is bounded on the north by Oregon, south by Arizona, east by Utah, and west by California, and contains 85,000 square miles. The population is not less than 30,000 active people. There are fourteen counties, and the following towns of importance: Carson (the capital of the State, and the seat of the United States branch mint), Virginia, Gold Hill, Dayton, Reno, Aurora, Austin, Elko, Hamilton, Treasure City, Shermantown, Belmont, Egan Cañon, Hot Creek, and Hyko.

There are 150 good quartz mills in the State with an aggregate of 2,300 stamps; and the production of silver since its discovery, in 1859, to December 31, 1869, has been about $135,000,000 (coin valuation).

The Comstock is the most developed mine in the State, having been proven as follows: In length, 3½ miles; in depth, 1,000 to 1,400 feet—on ten or more shafts; and in width from 70 to 120 feet. The gross production of this vein has been about $98,827,831 (coin valuation), averaging from $25 to $50 per ton. The aggregate net dividends, in excess of first investment, assessments, and cost of production, have been $14,129,860 (coin valuation). This has been done in the face of inexperience and enormous expenses. To-day it is being worked with great experience, reduced expenses, and a regular system.

The recently-completed railroad conveys ores from the mines to the new mills on the Truckee river, driven by water-power, and in close proximity to timber, which is hauled back to the mines for use in timbering. Ores are thus worked to-day at a profit, which, one year ago, could not be handled without loss to those attempting it. Another labor-saving enterprise has been inaugurated—the Sutro tunnel, which will cut the Comstock at a depth of 2,900 feet on its dip, in a length of 3¾ miles. Numerous expensive engines, for draining the mines and hoisting ore, will thus be dispensed with. The deposits of ore in this vein are worthy of notice.

On the northern portion they occur in chimneys, while on the southern portion they occur in sheets. The eastern and middle portions of the vein are invariably the most productive. With the consolidation of management into fewer companies, the railroad and Sutro tunnel, and latterly the finding of good ore in the deep workings of the mine, the prospects of the Comstock are excellent. It is to be regretted that the mines of Mexico and Peru are not worked with the same energy.

The excitement of Washoe was succeeded by the stampede of Reese river. The mines of this camp occur in granite, and are narrow. The ores are of high grade, and chiefly (in depth) sulphides of silver, associated with arsenic, copper, lead, antimony, etc. They require "roasting." This process of roasting has heretofore been the most expensive feature in the reduction of the ores of this district, but a cheap solution of the problem is rapidly being arrived at, in the form of the STETEFELDT furnace. The production of this district has been not less than $7,000,000, averaging $200 per ton. The leading company of this camp is the Manhattan, a very successful one, belonging to this city. It has no debts, and a large surplus; and lately made a dividend—facts due entirely to its prudent management and economy. The consolidation of interests and prosecution of work by a deep tunnel, are the imperious necessities of this camp.

We have thus seen some effects; let us study the cause. To many persons, the names "Washoe" and "Reese River" are synonymous with bad investment—ruin—swindle. Why? Every counterfeit proves the existence of a reality. Money itself is more counterfeited than any other thing. Counterfeit notes on a bad bank are unknown. Where does all the metal necessary for the production of money come from? From the mines. There must be, then, productive and successful mines, in spite of swindles. What have been, on the other hand, the causes of disaster in mining? Claims of undeveloped "feet" being offered for sale at the East, in nine cases out of ten, a company of millions of capital was got up, of which not one-fifth was paid in. But in numerous instances enough was paid in to have made a success. The agents of the company (honest or dishonest) either sunk the working capital in ill-directed and abortive operations or squandered it. Sometimes companies directed affairs from home; mills were erected, and the double blunder was committed of closing them up when they should have been kept running as custom mills, if an immediate supply of ore could not be obtained from the mines, for which they were originally built. Each of these causes, and many others, could be illustrated in detail. But it is to be hoped that they will be carefully studied by those most interested, and avoided in future. Again, a mining operation can now be inaugurated and carried through for one-third what it would have cost three years ago—a fact due to the Pacific Railroad, and the introduction of many mechanical improvements, which reduce the cost of production.

These few plain facts are denied by no careful observer:

1. That the supply of silver ore in Nevada is greater than the supply of iron ore in Pennsylvania.

2. It will yield from $30 to $300 per ton—averaging $75.

3. The cost of treatment is from $8 to $25 per ton—averaging $15; as shown by ten years' experience, and likely to be less in future. These facts constitute the conditions for a successful issue, when enterprises are conducted honestly, intelligently, and economically.

The experiment of Chinese labor is being tried in Nevada, in several localities, and is "a speck on the horizon."

The author finally declared the urgent necessity of a National School of Mines, to be situated in the heart of the mining regions, to be so fully established as to need no further comment.

## The Blow-pipe Assay.

BY PROF. A. B. PRESCOTT, OF THE UNIVERSITY OF MICHIGAN.

### III.

### GOLD.

Less susceptible of oxidation than silver, not oxidized in scorification, and sustaining no loss in cupellation, gold may be determined with great exactness by blow-pipe assay. But as its value is greater than that of silver, the extraction of much smaller proportions becomes necessary; and, as it is a denser metal, the globule of gold is much smaller than one of an equal weight of silver, and cannot be so precisely measured. For which two reasons it is necessary to work larger quantities of gold ores for single determinations. Another reason for the same necessity exists in the frequent alloying of gold with silver, which requires a wet operation upon the globule, difficult in proportion to the minuteness of the quantity. We have:

1. Gold in alloy with metals other than silver;
2. Gold in minerals—"gold ores."
3. Gold with silver.

#### I.—GOLD IN ALLOY WITH METALS OTHER THAN SILVER.

The assay is conducted precisely like the corresponding one of silver.

Somewhat more lead is required to remove copper from gold than from silver; but the proportions which have been given are sufficient for gold. If much copper is present, it is advisable to add a small globule of lead at the close of cupellation, and re-cupel; or a globule of lead may be added at the close of "oxidation," and the latter process repeated.

#### II.—GOLD IN MINERALS—"GOLD ORES."

In these cases the matrix may also contain silver.

*Quantity to be Assayed.*—$5 of gold per ton is about ¼ ounce per ton. One-fourth ounce is 0.00000864 of 29166 ounces (ton 2000 lbs.) That is, assaying one gramme of this ore, the globule would weigh 0.008 of a milligramme. Such a globule of gold falls a little above division 5 of HARKORT'S measuring scale. The gold globule of this size is capable of removal from the cupel with good forceps, (it should be done under a magnifier), and by aid of a good glass, it can be adjusted on the scale with approximate exactness. The weight of a globule filling the lines at division 5 is twice the weight of a globule filling the lines at division 4; and it would be easy to err one-fourth of a division in adjustment, involving the error of 25 per cent. of the true gold value of the assay.

Working 0.100 grammes of the same ore, ($5 gold per ton), the globule weighing .0008 of a milligramme, will fall upon the scale midway between divisions 2 and 3. Such a globule is practically invisible to the unaided eye, but it ought to be detected on a clean cupel, by aid of the magnifier, and to afford at least a qualitative test of precious metal.

Suppose we accept 0.00026 as a quantity capable of correct weight upon a fine balance. Now, a globule of this weight requires 25 grammes of $5 per ton gold ore to produce it—no loss occurring in extraction, and 115 grammes of $5 per ton ore will be required to furnish a globule weighing one milligramme. Evidently the poorest gold ores cannot be assayed altogether by the blow-pipe, in the absence of HARKORT'S scale. With the scale they may be so assayed, even by working no more than one gramme of ore. But two or three grammes of poor ores—or for close results upon any ores—should be taken for blow-pipe assay.

In presence of both gold and silver, the determination cannot be made by measurement before parting, and without a separate determination of the silver, as hereafter seen. It may be remarked, that the silver-lead of small *crucible* reductions may be oxidized and cupelled by the blow-pipe. In the absence of base reducible metal in the ore, this is not a very severe task; and the means of crucible reduction are much more easily carried or improvised than the means of muffle cupellation.

Roasting, dressing, reduction, scorification, oxidation, and cupellation, are performed alike upon gold and silver assays. The following additional treatment is recommended after roasting gold assays *containing iron or copper:*

*Ebulcoration.*—Transfer the roasted ore to a porcelain dish; treat with sufficient hydrochloric acid to dissolve out the iron and copper (which have been oxidized in roasting); warm and digest over a lamp; carefully evaporate to dryness; treat with boiling water; filter, and wash. The filtrate contains the soluble chlorides—those of iron and copper—with a little chloride of silver, if this metal be present. The washed residue is dried, and dressed with borax and proof-lead on the opened filter. If the material is intended for more than one portion in reduction and oxidation, such portions of dressed assay may be taken up with the scoop and cornetted. The filter is folded and treated as a cornet. The filtrate may be treated for its argentic chloride, by evaporating to dryness and dissolving with much hot water, which leaves the silver chloride as a residue.

*Calculation of Value per Ton.*—The United States gold dollar weighs 1.671829 grammes, or 25.8 grains. One troy ounce of United States standard gold makes $18.605 of coin; and one troy ounce of pure gold makes $20.67 of coin. The British tables of ton value are based upon the coin value of pure gold at $19.60 per troy ounce. (The value of United States standard gold, to United States standard silver, is as 14.834 to 1.000.)

#### GOLD WITH SILVER.

1*st. Separation by Nitric Acid.* "*Quartation.*"—It was formerly the statement that an alloy of gold and silver could be separated by nitric acid, only when the gold was not over one-fourth of the alloy, or one part of gold to three parts silver. More recent researches have authorized the statement that nitric acid will dissolve the silver from an alloy not over 2-7 gold, or one part gold to 2½ parts silver. If the proportion of gold be greater, the silver is partially or wholly protected from solution, and the gold from disintegration. Hence, if the silver of the alloy be less than 5-7, silver must be fused into the alloy, before treatment with nitric acid.

If the alloy contains 2 per cent. of silver, it has a brass color; if 30 per cent., a light brass color; and if 60 per cent., or more, the color of silver. If the alloy be white—not yellowish—add 0.6 to 0.8 parts; if light brass-colored, 2 parts; and if brass-colored, 2½ parts of silver. A slight excess of silver occasions no notable disadvantage.

When silver is to be added, the weighed globule is flattened, dressed with the requisite quantity of pure silver, 0.200 to 0.300 of proof-lead, and 0.030 to 0.040 of borax, in a cornet, fused to a globule in a charcoal cavity, and cupelled.

*Pure Silver.* Precipitate a solution of pure nitrate of silver with hydrochloric acid; reduce the washed and dried precipitate with soda, on charcoal, and, while the silver globule is still liquid, drop it from the support upon the (polished) anvil, previously placed in an evaporating dish. The minute globules, of various sizes, are preserved in a stopper bottle for use. One may be selected, by trial upon the balance, approximating the desired weight. If the silver of the assay is to be determined independently, the precise weight of the selected silver globule must be noted.

The globule of alloy designed for parting is flattened on the anvil, and placed in a test-tube, or little matrass. A little nitric acid of sp. gr. of 1.2 is boiled upon it, gently and continuously, till the action abates, when the residue is allowed to subside, and the fluid decanted upon a quantitative filter of about one inch radius. Nitric acid of sp. gr. of 1.3 or 1.4 is added to the residue, and gently boiled upon it, for a brief time after action ceases to be apparent. The whole is transferred to the filter, the matrass rinsed upon the filter with a few drops of water several times, and the residue well washed upon the filter. The filter is dried in the funnel, and dressed, while in the funnel, with 0.100 of proof-lead and 0,030 of borax—both of which are sprinkled upon the residue (and sides of the filter.) Fold the filter firmly, so as to inclose it in a cornet. Reduce, cupel, and weigh (or measure) the globule of pure gold. I give the preceding process, because I have found it satisfactory; and have found the washing of the gold residue by decantation without loss, or the ignition of the gold-residue with filter without loss of finely-divided gold, very difficult of performance upon the quantities obtained by blow-pipe assay. (Compare FRESENIUS' Quantitative Analysis, p. 418. PLATTNER directs the alloying of the gold residue with proof-lead, and cupellation of the same, in those cases where the amount of gold is too small to weigh.)

The gold should be tested for silver, after determination. Dissolve in aqua regia; evaporate excess of acid, and treat with acid water. Silver appears as a chloride.

The weight of the argentiferous gold globule, minus the weight of the gold globule, equals the weight of silver in the assay.

If it be desired to make an independent determination of the silver, it is separated from the filtrate and washings of the gold residue. The solution is evaporated nearly to dryness, treated with a little hydrochloric acid, diluted with cold water, filtered on a small filter, washed, dried, dressed in the filter with lead, soda, and borax, reduced in a cornet, and cupelled. The weight of any silver added for parting is deducted.

It will be seen that each of the separate determinations of gold, and of silver, may be made by measurement; but the silver-gold globule, as obtained from the assay, cannot be measured. It is important to a close result, when silver is present in notable proportion, that the assay be of a quantity permitting the determination of the silver-gold globules.

*Separation by Nitro-hydrochloric Acid.*—When the alloy is not over 15 per cent. silver. (FRESENIUS' Quantitative Analysis.)

*Separation by Sulphuric Acid.*—Little used as an analytical method. (FRESENIUS' Quantitative Analysis.)

### LEAD.

#### 1. OXIDIZED COMPOUNDS FREE FROM SULPHUR, ARSENIC, ETC.

The assay of these compounds is simply their reduction. It is necessary to perform the reduction with total exclusion of oxidizing influences. Precautions are so taken that, if any lead vaporizes as litharge, the vapor must pass through charcoal powder, and be reduced to metallic grains. Take of assay material (fine powder) 0.100; soda (always anhydrous for assaying) 0.100; borax 0.025, or sufficient for silicious or earthy gangue. Mix in agate or glass mortar; inclose in a cornet. Place the cornet in a reddle-coated clay capsule, having another capsule fitted as a cover; and fill the space around the cornet and between the capsules full of fine charcoal powder. With a convex charcoal borer make a concavity in a cube of charcoal (previously fitted in the charcoal furnace). The concavity receives just one of the two capsules. Cover the whole with the plane surface of a piece of charcoal having a concavity admitting the upper of the connected capsules.

*Clay capsules* are usually made by the assayer of fire-proof plastic clay (kaoline), by means of a mould and stamp of polished wood. The mould is ¾ inch in diameter, and 5-16 inch deep; and to this the stamp is accurately fitted. Knead the clay into a stiff paste, with water. Oil the mould and stamp. Over the middle of the mould place a slip of paper, ¼ inch broad and 3 inches long. Upon the centre of the paper and of the mould, place a ball of the clay-paste, a little less than ½ inch in diameter. Press the stamp evenly and firmly down in the matrix; then, by a gentle rotation, carefully withdraw it. Cut off the border of superfluous clay with a knife. If the edge of the clay basin be now seen to be of uneven or of too great thickness, the stamp is pressed again. The capsules should be made as thin as practicable. By gently pulling the paper slip, the basin is lifted out and placed on a slab to dry. After a few hours drying, the paper slips fall from the capsules, and they are then heated (in a crucible) over a lamp—finally, to redness. To fit one with another, they may be filed upon the edges.

The *Charcoal Furnace* is an iron foil case for the cube of charcoal. It is not indispensable in the blowpipe assay of lead and copper, but is almost indispensable to perfect work. *Without* the iron case, a cube of charcoal 3 inches on the side is employed, held in large crucible tongs, or adjusted upon a retort holder.

Through a perforation made in the side of the charcoal cube, upwards and inwards to the bottom of the clay capsule, apply a strong (oxidating) blow-pipe flame, for five to ten minutes. Inspection of the capsule should now reveal—(1) No shade of litharge; (2) The lead in one or more globules (with no globules requiring a magnifier to be visible). If there are fine globules (not impalpable), the result may be approved, though less satisfactory than that of larger globules. The globules are gathered by levigation (see ELDERHORST'S Manual, p. 29.)

#### II.—SULPHURETTED COMPOUNDS.

*First Method.*—Roast 0.100 of pulverized ore in an open reddle-coated clay capsule, with three volumes of charcoal—avoiding fusion. Heat is applied as in lead reduction. Pulverize, add charcoal, and repeat the roasting, until after pulverization the vapor of sulphur or arsenic ceases to arise. (The ore is sometimes mixed with one-third its weight of iron pyrites, to prevent incipient fusion and coagulation.)

Dress with soda and borax, and reduce as described for 1—Oxidized Lead Compounds.

*Second Method.*—This is performed without roasting. It depends on the reaction: PbS+Fe=Pb+FeS. (S=16.)

This method is an application of the more common method of the crucible assay of galenas. It requires the use of a blow-pipe crucible of clay. These are made in an iron mould, from a stiff paste of kaoline with water. The instrument is oiled, the stamp driven down by a mallet, and left for five minutes. The ring is then removed, the two sides very gently tapped with the hammer, that they may fall apart, leaving the soft crucible, which is then dried, and finally heated to redness. The crucible is used in the charcoal furnace. Place in the crucible 0.100 pulverized ore, and upon it about 0.050 of iron wire. Cover with a mixture of soda, 0.150; borax, 0.030; and tartaric acid, 0.020. Then cover the whole with 0.050 of chloride of sodium.

Place the crucible containing the dressed assay in a charcoal cavity, large enough to fully admit it; cover with the plane surface of a piece of charcoal, and give an intense oxidizing flame upon the subjacent charcoal for four or five minutes. Tap the crucible support, to gather the globules; cool the crucible in the iron mould, then break the crucible, and detach the globule. It is to be cleaned between moist filter-papers, on the anvil.

### COPPER.

#### I.—OXIDIZED COMPOUNDS.

These are treated without roasting. Take of pulverized ore, 0.100; soda, 0.100; borax, 0.050. Mix in an agate or glass mortar. If the ore has over 38 per cent. of copper, add 0.050 proof-lead, and mix. The addition of lead is to prevent sputtering of the fused globule of copper. The lead oxidates and passes into the slag.

*Reduction.*—Inclose in a cornet, and in a cylindrical charcoal cavity. Reduce by a *pure reducing* flame. It is not safe to persevere after complete reduction, for the sole purpose of gathering all the globules into one. If disconnected globules are found in the bead, pulverize and levigate. Wash and dry the copper.

If it is of a bright copper-color, and is malleable and tenacious, weigh; if not, affine.

*Affining.*—To the copper add (according to its degree of impurity) once or twice its weight of proof-lead. If lead has been added in the first dressing, and the globules have a dull color, very little lead need be now added. The lead is alloyed by inclosure in a cornet, and fusion on charcoal.

Make a cylindrical charcoal cavity 3-16 inch deep and ⅜ inch diameter. On another piece of charcoal, fuse to a bead a fragment of *boracic acid* of weight equal to the copper. Place the boracic acid bead in the charcoal cavity, with the copper-lead globule in *contact* with *it* (the bead being in contact with the *side* of the charcoal cavity. Touch the reducing flame to the bead till it fuses, then direct the midway flame upon it (the bead), and continue till the lead, with impurities, is oxidized out of the copper into the boracic acid.

The affining of copper is a sort of semi-cupellation, the oxidating influence being checked by the contact of charcoal, and the limited amount of oxygen in the flame. The boracic acid removes oxidized impurities, and partially protects the copper from oxidation.

In the separation of copper from large proportions of lead, it is necessary to renew the boracic acid bead during the affinage ("concentration" and "affinage.") If the process is properly conducted, the bead remains free from globules of copper. If copper is oxidized, it is (mostly) reduced in the bead; but it is desirable to oxidize as little as possible.

The bead is detached from the cooled globule, cleaned, and weighed. If globules have appeared in the bead, it may be pulverized and levigated, for separation of its copper, which is washed, dried, and weighed.

#### II.—SULPHURETTED COMPOUNDS.

This treatment will also apply to compounds containing arsenic. Of the pulverized ore, 0.100 is roasted in a clay basin, with three volumes of charcoal powder—avoiding fusion, and repeating the operation, etc., precisely as with galena. The roasted ore is dressed with 0.100 of soda and 0.050 of borax, and treated precisely like "Oxidized Copper Compounds."

Copper sulphate should be dissolved, the solution precipitated with solution of potassa, and the washed and dried oxide (from 0.100 of the vitriol) assayed as 1.

If iron be present, the copper globule becomes coated with ferric oxide. This is removed, in affining, after use of a bead of boracic acid, by another bead, not of boracic acid, but of borax. If the globule still remain rust-colored, a little more lead may be added, and affinage continued.

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THE Viceroy of Egypt has ordered from a leading French mechanical company an iron floating dock. The dock will be of large dimensions, and will weigh 4,600 tons.

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M. DE LESSEPS is to receive the title of the Duke of Suez.

## CORRESPONDENCE.

### The Red Sea.

NEW YORK, Dec. 13, 1869.

TO THE EDITOR: Sir—Your recent article upon the Suez Canal, and more especially your allusion to the meagre and incomplete information possessed by us concerning the Red Sea, must be my excuse for offering the following statements, derived from personal observation, and possibly of sufficient value to be laid before your readers.

The entire length of the Red Sea is 1,400 English miles. Its breadth varies from 20 miles at the Straits of Bab-el-Mandeb to 230 miles at about lat. 16 deg. 30 min. north. It divides at Râs Mohammed (27 deg. 40 min. north lat.) into two arms, the western one being the Gulf of Suez, 180 miles long, the greatest breadth of which is 30 miles. The Red Sea varies in depth from 3 to 5 fathoms in Suez harbor to 1050 fathoms in lat. 22 deg. 30 min., which is the deepest sounding obtained. The navigation is dangerous and intricate, on account of the number of coral reefs, shoals, and islands, single or in groups, which are most abundant on the Arabian side. These difficulties are increased by the prevalence of north or south winds, also frequent dead calms. From May to October the wind is southwest; the rest of the year, northeast. Sailing vessels, carrying coal from Aden to Suez, are sometimes two months and upwards on the trip. At Bab-el-Mandeb all ships have to take native pilots, even the steamers of the Indian lines. Quite as many of the steamers of the Peninsular and Oriental Company have been lost in the Red Sea as in the Indian Ocean, the Atlantic, or the Mediterranean. Should the traffic assume very large dimensions, ships are likely to find difficulty in procuring reliable pilots at all times. Already the first merchant ship that passed the Canal of Suez is reported wrecked in the Red Sea. Another disadvantage is the excessive heat, which, in July and August, is almost insupportable, so that every year passengers are killed by sunstroke on the Indian steamers. Sailing vessels will necessarily be much more exposed to the evil effects of the climate, since they cannot be so well ventilated and fitted for comfort as the splendid Peninsular and Oriental steamers, and moreover, will be delayed for an uncertain period in the journey, which the latter complete in about six days. V.

### Montana.

THE MINES AND MINERAL RESOURCES OF JEFFERSON COUNTY.

NEW YORK, December 14th, 1869.

TO THE EDITOR—SIR: In the very centre of a broad belt of the Rocky mountains, between Lewis and Clark county on the north, and Madison county on the south, lies Jefferson county, which in point of mineral resources, bids fair to excel any other county in Montana. The richest placer mines and the most valuable quartz lodes are located in that county, and the rapid progress of their development renders it more worthy of especial attention. The total yield of gold and silver during the past year, will probably be several millions. The gold mines and placer diggings in the valley of the Little Boulder are worthy of notice, as opened with a large but wise outlay of capital, so expended as to secure an extremely low rate of subsequent running cost. A number of extensive enterprises have failed in Jefferson county. To comprehend this, it is necessary to look back through the insane mining fever through which the Territory had passed, and see how the eastern people foolishly rushed into mining speculations, often purchasing anything that was offered, if called a "gold mine"; and as soon as the purchases were made, they would form a joint stock company, with a capital of a million or more dollars and a small working capital, and purchase steam boilers, engines and stamps, or any other paraphernalia requisite, as they thought, to work their mining property, and send them all, at great expense, some seven hundred miles across the plains, some parts of the machinery being often scattered along the route, never reaching their place of destination.

In the meantime, a person was sent from the East as superintendent, who never before had charge of constructing anything. He would commence work on a spot pointed out to him as his lode, and long before he got through would have gone far beyond the expected outlay. When the stamp and engines arrived—if such a thing took place at all—the working capital would all be gone.

Other companies, under better management, met with better success; but all who had stamp mills, learned by sad experience that with them and the amalgamating plates, only a portion of the gold in the ores could be obtained. Yet some of the mines, such as the Blue Cloud, Big Indian, and other celebrated lodes, are so rich that, in spite of the imperfections of the apparatus, the companies working them, though losing all the silver, all the copper, and perhaps three-quarters of the gold, have nevertheless made and are now making money out of their comparatively small returns.

Another drawback to the successful working of quartz mines in this county, is the deficiency in length of some of the claims. The companies are often located high up on a mountain side, where ores have to be raised and water pumped from a depth of hundreds of feet; whereas, if one company owned the entire lode, it could be easily drained and worked from the base of the mountain. This is the condition of the Atlantic and the Manhattan Companies', two of the most valuable mines here, and admirably located for tunnelling.

While considering the many errors of the past, we cannot forget the untiring energy of some of the present managers of mines here, who, struggling with many disadvantages, are making the best use of their stamp mills on their present ores. The Big Indian lode, the richest mine in the country, is owned by the "I.X.L." Company, of which PERRY RICKER is the superintendent. They have a shaft sunk some eighty feet in depth. The lode is composed entirely of decomposed quartz. It is vigorously worked by the company, and yields handsome profits. The "Old Chief" is another rich mine, and is worked by private enterprise. This mine is fully developed, has its own mill, and yields $85 to the ton of rock. The mines in and about Montana city, which are too numerous to mention, are all being fully developed, and some of them are yielding very handsomely. There are but eight quartz mills in the county in working order, and all are now in full operation. Wages are from $6 to $8 per day in gold. Each of these mills crush from two to three tons of ore per stamp every twenty-four hours. The Tecumseh, Esmeralda, White-tail Deer, and Union lodes are all developed, and their owners have applied to have patents granted from Washington.

The Placer and Gulch mines are being rapidly worked out. The principal mines are located in Indian Creek, some paying from $24 to $30 to the hands employed. These diggings are all very shallow, some of them being only four feet to the bed-rock. Among the successful miners in Indian Creek are ROBERT GILLMAN, JAMES RHODES, and J. H. ROBERTSON, who have made independent fortunes in the last two years. J. H. ROBINSON, with a ditch seven miles long in Boulder Valley, is doing more to enrich the territory than any other individual in the country. Another ditch, seven miles in length, leads from White Horse Creek to Springville bars. The placer mines of the Little Boulder Valley are very rich. The difficulty, however in working these diggings is, that the depth to the bed-rock in some places is thirty feet, and also the existence of a great scarcity of water. Mr. J. R. PLAISTED has commenced to construct a bed-rock flume, running throughout the entire length of the gulch. This is a work of great expense, but when completed, which will be some time next season, it will do much to surmount the obstacles now surrounding the successful working of the mines in this region. The gold is coarse, but of a very fine quality, being worth eighteen dollars an ounce. The placer mines in the vicinity and on the outskirts of Jefferson city are all very nearly worked out. They are very shallow, and, owing to the abundant water streams in that location, the facilities for working these mines have been good.

The main resources of the county will be the quartz mines; and when the requisite amount of capital is brought to bear, it will render Jefferson county one of the most valuable, if not by all odds the most valuable, mining district in Montana Territory. N.

### Applications for Patents to Mineral Lands.

From the Report of the Commission of the General Land Office, for 1868.

1. All applications for patents under the mining act should be in writing, in which should be stated the name of the applicants, and whether the claim is made by individuals, or a partnership or corporation; it should designate the mining district, county, and State, in which the claim is located; describe the character of the mine, as to whether it bears gold, silver, cinnabar, or copper; state the number of feet claimed along the lode and laterally; the date of the original location of the claim under the mining customs; when and where it was recorded; the names of the latter, whether by deed or verbal contract of parties in or out of possession; the nature and value of the improvements made or labor performed; whether the applicant is occupying the claim or is out of possession; and finally, whether the claim is one in regard to the possession of which there is any controversy or opposing claim within the knowledge of the applicant. The application should further state that claimant has posted a diagram in a conspicuous place on the claim, together with a notice of his intention to apply for a patent, with the date of posting such notice and diagram: and it should distinctly appear to whom the patent is to issue.

2. With the application there must be filed, first, a diagram of the claim, similar to that posted in a conspicuous place thereon, representing its boundaries and location, its length along the lode, with the surface ground necessary to the convenient working of the mine; second, a copy of the notice posted on the claim with the diagram; third, a certified copy of the mining customs of the district; fourth, a certified copy of the record of the location from the recorder's office; fifth, if the applicant is a corporation, a certified copy of the charter or certificate of incorporation; sixth, if the application is made by an individual or an unincorporated company, an affidavit or affidavits of citizenship, or of having filed a declaration of intention to become a citizen, the applicant s own affidavit will be sufficient; facts must be stated, such as place of nativity, in what court declaration of intention was filed, and the date of such declaration, with a certified copy of the same; if applicant claims to be a citizen, he must state in his affidavit the place of his birth, his residence for the past five years, and whether he has exercised the elective franchise, and where; seventh, the affidavit of claimant that he is in the occupancy of the claim, stating the length of time he has occupied the same, the amount of money and labor expended thereon, and that he knows of no adverse claim to the possession; and eighth, if claimant is in possession under purchase, a certified copy of the deed, or if the deeds are numerous, a brief abstract of title, certified by the recorder, or even a certificate from that officer that a regular chain of title, ending in the applicant, appears on his records, will answer the purpose.

3. Upon filing these papers, the register of the land office will make the publication required in the third section of the act in a newspaper published nearest the claim, carefully stating in the notice the name of the claimant, of the mine, district, and county; also the names of the adjoining claimants, and if the claim is a relocation, the names of former claimants and claim, designating the lode, and, as near as practicable, the locality of the claim upon the lode.

The names of the adjoining claims and claimants ought never to be omitted, as that will generally be found one of the readiest means of fixing the locality of the claim. The register will also post a copy of the notice in his office for the period of ninety days, and on the publisher's presenting his account, the register will transmit the same to the surveyor-general, unless the applicant has made provision for its immediate payment, in which case a duplicate receipt will be taken from the publisher, one of which to be transmitted to the General Land Office.

4. On the expiration of ninety days after posting diagram and notice, the claimant or his agent must file his own affidavit, with that of some other person cognizant of the fact, with the register and receiver, that said diagram and notice were posted in a conspicuous place on the claim at least ninety days, or prove the same by verbal testimony to the satisfaction of these officers, If all the proof furnished is satisfactory to the register and receiver, and no adverse claim has been filed, the applicant for a patent will apply to the surveyor-general for an estimate of the expenses of surveying or platting the claim and of making publication, if the latter has not been paid by the applicant; and on depositing the amount with any assistant United States treasurer, or designated depositary, in favor of the United States treasury, to be passed to the credit of the fund created by "individual depositors for surveys of the public land," and filing with the surveyor-general one of the duplicate certificates of deposit taken by the claimant, that officer will order the claim to be surveyed, and transmit the certificate of deposit to the General Land Office. If an adverse claimant appears before application is made to the surveyor-general for a survey, no action will be taken by that officer until the question as to possession is settled in the courts.

5. The survey, when made, must be approved by the surveyor-general, who will also make a plat of the claim, accurately representing its boundaries, its area, and its relative position in respect to the subdivisions of the public surveys, the township and range lines being extended for this purpose according to instructions on page seven, circular of January 14, 1867, if the claim is upon unsurveyed land. In the margin of the plat the surveyor-general will endorse his approval of the survey as in other government plats; also his certificate of the value of the labor and improvements, and of the character of the vein exposed, and will transmit papers to the local officers and to the General Land Office, as heretofore instructed.

6. The register and receiver will carefully examine all testimony presented, whether in the form of affidavits or parol proof, exercising the precautions heretofore recommended in reference to the former. They will also examine the returns of survey approved by the surveyor-general, and transmit the application with all the testimony, if the same is satisfactory to them, endorsed with their approval to the General Land Office, if no opposing claimant appears before the approval of the survey, so that a patent may at once be issued.

### The Suez Canal.

The following dates and figures may be found useful for reference with regard to this great work, which is, as *Engineering* justly remarks, "not less vast and monumental, because it is the triumph of contraction, rather than of engineers."

M. FERDINAND DE LESSEPS was appointed Consul to Egypt in 1831, but did not gain the active aid of that government for his plan until November 30, 1854, the date of the first concession. A second act of concession was granted January 5, 1856; the subscription in France was opened November, 1858; the first spadeful of sand was thrown out on the shore of Lake Mengaleh, April 25, 1859. The different contracts for the work were let as follows:

October, 1863, Port Said Harbor, 327,000 yards béton, $2,000,000; January, 1864, dredging harbor and 37¼ miles of the canal, 28,383,600 yards, $6,000,000; October, 1863, dredging eight miles of the canal and the deep cutting, 11,772,000 yards, $2,800,000; April, 1864, 52¾ miles of the canal, 32,046,000 yards, $2,240,000. According to these figures, the whole sum paid to contractors must have been more than $20,000,000; but this does not include all the expenses of the company.

### The Gold Hill Fire still Burning.

THE terrible and fatal fire which broke out in the Gold Hill mines on the 7th of April last, and which resulted in the destruction of a large number of lives, is still smouldering. After it had been reduced to close quarters, it was carefully walled in, and work was again started in different directions around it. It was thought to have been extinguished long ago; but such, it appears, is not the case, for a few days since some miners working between the 600 and 700-foot levels of the Kentuck mine suddenly picked through into a space where there was plenty of fire, finding large brands of it. The place was at once closed up again. Being as far as possible shut in and kept from the encouragement of atmospheric air, the fire merely smoulders, but it is there, nevertheless, and may keep on burning for many months to come. It can do no particular harm, however, as it is merely burning out the old timbering where the mine has been worked out.—*San Francisco Mining Press.*

### Unstamped Mining Checks.

WARRANTS were recently issued in Michigan for the arrest of ten or twelve iron and copper companies doing business at different points on Lake Superior, on charges of issuing unstamped checks or evidences of amounts of money to be paid on demand. These companies issue from $20,000 to $60,000 of this scrip per month, to pay their workmen, mainly in $5 and $10 notes, which are engraved in a manner similar to a bank note, and they circulate through the Lake Superior country, and are paid at the office of the company issuing them, in Cleveland, Pittsburgh or other places. This system has been carried on for several years.

## The Proposed Darien Canal.

IT is reported that the CUSHING treaty, which gave the right of way for the Darien Ship Canal, and which was rejected last spring by the Colombian Senate, will shortly be reconsidered by that body, and undoubtedly ratified. Meanwhile the United States steamer *Nipsic* has departed for Aspinwall, to engage in explorations, and ascertain by surveys the most feasible route, of which there are three prominently talked of, viz.: The Isthmus of Panama, which is only twenty-eight miles wide; the Nicaragua route up the river San Juan, which would only require the construction of a canal sixteen miles long, the remainder of the route being by way of Lake Nicaragua, ninety miles long, and the river San Juan; the Tehuantepec route, which is one hundred and thirty miles across from sea to sea, lying, throughout, along the Coatzacoalcos river.

All that our Government proposes to do at present is to carefully examine the several routes, so as to determine which would be the best and least expensive; and when that has been done, Congress will doubtless be called on to say whether the value of the canal will be equal to its cost. It is felt that the examination should not, as heretofore, be restricted within narrow bounds. A complete and comprehensive survey, including the whole eastern part of the Isthmus, can alone decide the much-discussed problem, either affirmatively or negatively. Our authorities are evidently satisfied that the public mind will never settle on any project for a ship canal, until the whole province of Darien has been correctly described, and until the condition of the mountain range has been determined by means which will bear scientific scrutiny.

That such a connecting link between the Atlantic and Pacific Oceans would result in a great addition to the foreign commerce of the United States, there is every reason to believe, and in the light of events which have transpired within the last few years, there seems to be no doubt that the enterprise will be undertaken as soon as the preliminary arrangements shall have been completed. As the Secretary of the Navy states, in his Annual Report, "we have reached the utmost limit of utility in the study and discussion of the subject, and the time has now come for action in the field." With the Atlantic and Pacific united by such an artery as the great ship canal, the sea-ports of the United States would be enabled to compete successfully with those of Western Europe in the vast East India region, including all the rich outlying islands from Java to Japan, and even with those of Great Britain, for the trade of her own Asiatic and Australian colonies. Moreover, our trade with the West Coast of South America, now only about eight millions of dollars per annum, against forty millions for Great Britain, and rising twenty millions for France, would soon exceed that of any other nation. In this last aspect alone, therefore, the existence of such an inter-oceanic passage would mean a ten-fold increase to the foreign trade of the country, to say nothing of its improved facilities of communication with the West Coast of Mexico and our Pacific Coast possessions. As to the aggregate augmentation of foreign trade, that would, in no remote period after the establishment of the new route, be counted doubtless by hundreds of millions. In brief terms, such an inter-oceanic ship transit seems to be imperatively needed to fulfil the commercial and industrial destiny of the United States.—*N. Y Shipping List.*

## Pacific Railroad Traffic.

ALTHOUGH the falling off in the freight traffic to California by the water routes, during the past few months, is pretty generally known to be due to the considerable quantities of goods shipped by the Pacific railroad, yet very few people—not immediately interested—probably have any adequate idea of the magnitude and diversified character of the overland traffic. A San Francisco paper gives a list of the goods received there by the overland railroad to the end of last month, which, notwithstanding the comparatively high rates of freight, comprises almost every variety of article which goes to supply the natural wants, or those artificial ones incident to Pacific coast civilization. Of goods unspecified, there are several thousand packages; of butter, 3400 packages; cheese, 2912 boxes; hams, 198 do.; eggs, 639 do.; fish, 138 kits; hops, 104 bales; cranberries, 172 barrels; raisins, 440 boxes; boots and shoes, 4019 do.; clothing, 207 packages; domestics, 1215 do.; dry goods, 435 do.; carpets, 404 bales; flannels and blankets, 82 do.; glassware, 389 packages; drugs, 386 do.; paper, 90 do.; furniture, 150 do.; clocks, 424 cases; yeast powders, 126 boxes; candles, 165 do.; hardware 313 packages; shovels, 40 cases; plows, 333; tobacco, 1417 packages; besides a great variety of articles for the use of agriculturists, mechanics, shop-keepers, and the household, such as fancy and millinery goods, house-furnishing articles, live stock, etc. When it is considered that the road is a single track, and even now imperfectly equipped, the traffic during the few months since its completion is quite remarkable. Not only have the through shipments been far beyond the expectations of the managers, but the intermediate places have been so liberally supplied with Eastern goods as to deprive San Francisco of a large portion of the lucrative distributive trade which she has hitherto enjoyed with the interior of California, Nevada, Oregon, Montana, Utah, Idaho, etc., by reason of her being the exclusive *entrepot* for these goods. But, on the principle that steam creates commerce, San Francisco must, in due time, find compensation for this loss in an increase of both her foreign and domestic commerce.

## Lurman Blast Furnaces.

The proprietors of the Willenhall furnaces and collieries furnish the London *Mining Journal* with the following statement of results:

The materials worked are our own clay-band iron-stones, with a small proportion of black-band of North Staffordshire.

No. 1. Furnace *without* the improved Lurman's patent hearth; Iron-stone, 1 ton 13 cwts. to 5 barrows of coal and 1 barrow of coke.

No. 3. Furnace *with* the improved patent hearth: iron-stone 1 ton 18 cwts. to 5 barrows of coal and 1 barrow of coke.

The pig iron produced from No. 3, also, is more regular, and rather greyer than from No. 1. No furnace bars are required. There is also a saving of labor, inasmuch as we only require two men to work the furnace, instead of three men in each turn for 27 hours. The wages are 3s. per man per day.

# MINING SUMMARY.

## Nevada.

### MORE TROUBLE FOR THE EBERHARDT.

The reputed owners of the Cave of Mammon—the Eberhardt of White Pine—are likely to be placed in hot water again. According to the *Inland Empire*, of November 18th, Herman W. Fenn, by his attorney in fact, A. J. Leathers, has instituted a suit against the Eberhardt magnates for the recovery of his one-fourth interest in that mine, and damages to the amount of $325,000! Fenn's complaint sets forth that prior to January 1, 1868, he was the owner, and in possession, of a one-fourth share, consisting of 200 feet, of the Eberhardt ledge, which was located January 3, 1868, in the names of McAuley, Crawford, Drake, and Sproule; but was originally located in the names of McAuley, Drake, Crawford, and Fenn. The plaintiff alleges that he was ousted by the defendants, who have ever since kept unlawful possession of his property. He alleges further that the defendants have extracted from the Eberhardt ledge, and converted to their own use, the sum of $1,200,000 gold coin. He prays for the restitution of his interest of 200 feet in the Eberhardt, $25,000 damages for his unlawful ejectment; and $300,000 as his one-fourth share of the bullion extracted. In their answer the defendants deny the material allegations of the plaintiff.

### LETTER FROM COPE DISTRICT.

A correspondent of the Elko *Independent*, November 23d, writes cheeringly of mining affairs in Cope District. He says: "Everybody is in high glee at the prospects of a good time coming. The fine ten-stamp mill of Atchison, Drew & Co. is almost ready to run. The owners of several mines are busy at work getting out ore, and judging from present appearance, the mill will have more rock than it can crush. The mines are improving as they are worked, and all that this camp needs to rank A No. 1, is a little capital, more mills, and a few live men to stir up the drones. I paid a visit to the Mammoth mine to-day, and was agreeably surprised when I saw the pile of ore they have out, the result of three weeks' work for three men. They have fifty tons of first-class ore, and one hundred and fifty tons of second-class. The vein of quartz is fully four feet wide, and carries mineral all the way. On the Great Eastern, the same company have carried an incline down fifty-three feet, thus showing a splendid vein. On the Crescent, Lucas & Carter are at work exposing to view as fine a body of rich ore as it has been our good luck to see for many a day. On the Hamilton ledge, Uncle John Atchison is sinking a perpendicular shaft to strike the ledge deep. He has taken out from the surface over 200 tons of good milling ore already. We also paid a visit to the Keystone, Argenta, Fuller, and Estell. On the two former they were at work. On the dumps of the Keystone are some 70 tons of first-class rock, nicely assorted, ready for the mill, and about twice that amount of second-class ore. The Keystone is a parallel ledge with the Argenta, and about 200 feet distant. At the Argenta mine they were busy at work taking out some very fine ore. This mine ships all its first-class ore to San Francisco, and from there it is shipped to Swansea. At the Estell we found no one at work, although it is a fine vein of mineral three feet wide. The owners of this mine have an incline down thirty feet. On the Fuller, which is close to the Estell, there has been but very little done as yet, although it shows some very fine ore, principally horn silver. I also saw some very fine specimens of ore from Bull Run district, from Fuller & Co's locations. This district is situated about fifteen miles southwest from Mountain City; it was organized last June, and has about one hundred ledges located, among which many give promise of rich returns to their owners. I am informed that Gov. Chellis is here this Winter, with a party of men, opening his claims, and anticipates erecting a mill in the Spring."

### EUREKA DISTRICT.

This district is again attracting the attention of the people of Nevada. A correspondent of the Austin *Reveille* says: "Col. Buel, I. C. Bateman, Col. Robbins, and some others, have taken hold here, and there is already quite an excitement started. People and business houses are arriving daily from Hamilton, and lots are selling at $200 cash on Main street, and are almost all taken. The Eureka furnace, under Col. Buel's management, will start in two or three days; also Col. Robbins' and one or two more furnaces are about to be commenced. Col. Robbins also has a mill on the road, which will be here in fourteen days the latest. Some large sales of mines have also to be reported. The Champion and the Buck-eye, two of the best mines in the district, were bought by Messrs. Buel and Bateman. On the whole, things look very promising in this section. With the mill once started here, the adjoining districts, such as Secret Valley, Sierra, Spring Valley, etc., will all come out. Eureka promises to be a lively place, and it is the center of all surrounding camps. Grass, water, wood, and particularly building stone, are all conveniently located. Twenty tons of lead bullion, the product of the Eureka farm for thirty days, were recently sent to San Francisco to be refined. We have no estimate of the silver value of the lead per ton."

### THE STETEFELDT FURNACE.

We copy the following in relation to the "coming" chloridizing furnace from the *Reno Crescent* of November 20: "A shipment of ores from Bull Run district via Elko arrived here day before yesterday on its way to San Francisco, where most of the rich ore along the line of the railroad has been hitherto sold at prices satisfactory to mine owners. This lot stopped here and went to the Auburn mill to be worked by the Stetefeldt chloridizing furnace. Yesterday the owners received $94 per ton for their ore net, after paying all charges of transportation, milling, etc. The same lot would have yielded in San Francisco only $69 net per ton. A shipment of ore from Humboldt county worked yesterday at the Auburn mill netted the owners $30 per ton. If shipped to San Francisco it would not have paid expenses."

### THE WHITE PINE REGION—REPORT OF THE MILITARY EXPLORATION PARTY.

The report of Lieutenant George Wheeler, of the Corps of Engineers, who, with Lieutenant Lockwood, led the exploring party sent out a few months ago by General Ord to discover a route through the White Pine country to the Colorado river, to which reference has been made in our San Francisco dispatches and in the report of the Secretary of War, contains a great deal of valuable information. Lieutenant Wheeler says the specific objects of the reconnoissance were to gain as careful topographical features as possible, to examine and locate the different mining districts so far discovered, to examine and report upon the necessity of military posts at any point or points, to gain information in regard to the number, habits and dispositions of the various Indian tribes; all with a view of finding the most practicable route for rail and ordinary travel from a point on the Central Pacific Railroad to the head of navigation of the Colorado.

#### THE ROUTE.

The exploring party consisted of forty-eight persons; they had with them eighty-five animals, and a quantity of supplies and camp stuff. The actual start was made from White Pine, or a point three miles to the east, on the first of August. A course nearly east was taken, in order to reach Steptoe Valley; thence the main line of the reconnoissance was to be nearly due south to the Colorado as practicable, making back upon a more westerly line. Such plan has been carried out. The reconnoissance has been extended over a line of between 1,600 and 1,700 miles, including all detours; seventeen mining districts have been visited and examined, and twenty-five valleys traversed, each in nearly a longitudinal direction.

#### GENERAL OBSERVATIONS.

The entire region offers but few chances for agriculture, and has comparatively little wood and timber. Of the valleys visited Pahranagat Valley is the largest and most fertile. Its waters come from three large springs, known in order, commencing at the head of the valley, as Hyko, Crystal and Ash Springs. These, flowing down for the entire extent, sink in Pahranagat Lake. Quite near the first of these has grown up the little mining town called Hyko. It is on an elevation above the sea level of 3,820 feet. As the lake is approached the soil is of a deep, moist and dark colored loam. The land between Hyko and Crystal Springs has not yet been brought under cultivation, for the reason that the water of the springs has been allowed to find its way to the surface and remain stagnant in many places for lengthened intervals. However, by this action the land has been benefitted, and Lieutenant Wheeler thinks that, should one large ditch be cut and carried round upon the Mesa to the westward, the region would be opened and prove the finest and best in the entire valley. About Crystal Lake are 3,000 acres at least of very valuable land. The various grains and vegetables raised are of a superior character and large yield. The climate, including the winter season, for seven or eight months is very equable, at no time showing any great extreme of heat or cold. Snow never remains on the ground for more than twenty-four hours. During the midsummer the heat is at times excessive.

#### MINES AND MINING.

Mining in Nevada is still in its infancy, but among the great number of silver mining districts already discovered, many present exceedingly favorable appearances, while from those that have been worked to a considerable extent and show signs of permanency, large results may be anticipated. Among the latter, the great Hyko Silver lode, in the Pahranagat district, about ten miles from Hyko, makes the best showing for a fissure vein. These mines were discovered in March, 1865, an Indian having guided white men to the surface croppings. The company now operating have a fine ten-stamp mill, with arrangements for roasting ore, situated at Hyko. The great Hyko lode, from which ore has been taken, extends in one continuous line of more than five miles, bearing nearly magnetic north, and situated in elevation some 1,300 to 1,400 feet below the summit of the great quartz Mountain, that has an elevation of 8,375 feet. The formation at this locality has its counterpart in many sections, showing principally on the surface dolomitic limestone of silurian age, in many cases highly metamorphic. The general upheaval of the great ranges of mountains has been in one grand wave, whose longitudinal axis was nearly due north and south, the continuity of whose force, as if turned by friction, in many places creating great irregularity of motion in the subsidence; at these points vast mountain spurs have been formed, tending for the most part to the northeast. Great action of this nature is shown in this vicinity, of which the variety of canyons and contortions of hills are examples. The principal locations that have been thoroughly developed are the Illinois and the Indiana; the former opened to a depth of nearly 400 feet below the surface, bears slightly to the east of magnetic north, showing a dip of about 80° toward the mountains; at most points the ledge measured from 16 to 21 feet in width, and this between well-marked walls on either side. The best of indications are here of a true fissure vein of great thickness and undoubted permanency. The Indiana, wherever opened, has shown walls of the same nature as the Illinois, and precisely the same character of ores. So far an average of ores taken from this vein, after careful sorting, will work from $50 to $75 per ton, while those at the surface, and from various localities that are but offshoots from the mother vein, make a much finer showing in the returns per ton, in a number of instances running from $300 to $500.

#### THE ROADWAY.

This country, until quite lately so little known, is fast coming into prominence. When the time comes for joining the Central Pacific Railroad with the head of navigation of the Colorado or Southern Pacific Railroad, Pahranagat Valley will be found to offer the most legitimate roadway. And if Government sees fit to place a military post at a point on the line through to the South, looking to a permanent development of the country, no better point than Pahranagat Valley will be found available.

## California.

### MINING IN PLACER COUNTY.

A correspondent of the San Francisco *Mining Press* thus reviews the mining interests of Placer County: "When at Colfax I visited the Rising Sun Q. M. Co., which has a small five-stamp mill, but it was not running at the time I was there, having suspended for a short time to make repairs. This company has made some very excellent runs within the past six months. Their rock looks well, shows much free gold, with good-looking sulphurets, which also assay well. They have done but little as yet towards developing their mine, as their shaft is down only about twenty feet. From Colfax I went to Iowa Hill, about half a mile from which I visited the cement claim owned by the Morning Star M. and M. Co. They have a fine ten-stamp mill, built by J. G. Bisbee, which commenced crushing gravel about three months ago. The mill is run only during the day time. The foreman, Mr. J. Mitchell, accompanied me through the mine. Passing into the tunnel about 400 feet, we found some eight or ten miners picking away at the cement. The mine is worked night and day. Gold was readily discovered in the cement. I was informed that there are twenty-four shares in the company, and that a majority of the stockholders are workingmen. They clean up from fifty to one hundred ounces. [Our correspondent does not say how often.] They find that it pays to work from eight to ten feet into the bed

rock in this mine—a very unusual occurrence. There are other placer claims near this locality, owned by W. Wisler and others, upon which preparations are being made for winter's work. At Wisconsin Hill, two miles distant, there are some very large claims; but they are not worked at present for want of water. Mr. O. J. Spencer's (Mt. Pleasant) saw-mill is actively at work sawing out blocks for sluice boxes. These blocks are from two to three inches thick, and are affixed to the sides (and bottoms?), by the use of which the boxes are made to last three times as long as without. The first cost is a little more, but the saving in the end is considerable. Twelve miles more brings the traveler to Damascus, another small mining town. Here I found two companies operating quite extensively. The Mountain Gate Co. have an old tunnel in some 3,500 feet, and have just completed a second, lower down the hillside, which is now in over 3,000 feet, where the cement is paying well. The mine is owned by twenty-three shareholders, every one of whom is a shareholder, and does his regular day's work upon the claim. Twenty-two were at work the day I visited the mine. The last clean-up, after a two weeks' run, gave them 120 ounces of gold. They are not now employing any extra hands, but soon will do so. Such a company is bound to succeed. There is no business in the world where co-operation, under good management, will succeed better than in mining. The next mine visited was the Lewis claim—an old claim, containing very hard cement. The company have a tunnel in some 700 feet. They have at present only six men employed. The old company erected a mill, some years ago, at a cost of $30,000. The cement is taken out and dumped in a pile, where it is left eight or ten days to 'stocken,' when it is worked in sluices. I understood it was the intention to commence crushing soon; but why they do not crush at present I did not learn. I see no reason why the claim should not be a valuable one.

"From Damascus I passed on to Michigan Bluffs, where I found the various companies making extensive repairs and getting ready for winter work. Messrs. Erman & Co. have paid $19,000 for a ditch, and bought some very valuable mining ground for $3,000. They have half a mile of main tunnel, besides numerous side drifts. There are many miners working, and doing well at the river, and up the canyon."

THE MINES OF NEVADA COUNTY.

From files of the Grass Valley *Union* to November 23 we take the following items of mining news: "Mining in Grass Valley was never more brisk or more profitable than it is to-day. We hear the best of news from the upper part of the county. Near Nevada City the Pittsburg is yielding splendid rock. At a point 30 feet south of the old works the rock taken out yielded $98 per ton in free gold, and the sulphurets at Maltman's works yielded $150 per ton. The yield of rock and sulphurets together gives as the proceeds per ton about $135. Delano has sent below a bar of gold worth $6,000, the product of Perrin's mine, Wolf creek, in two weeks' run. The shaft is being re-timbered, and the workmen are not taking out ore. This mine employs 22 men, and its yield since opened has amounted from $11,000 to $12,000 per month. Hoisting, pumping, and crushing are done by water-power. The Wisconsin mine and mill has started up, the old employes leasing the works. The John Bright will have a whim in operation in a few days. Good rock is coming out. At Rattlesnake, Endy & Co. are about putting up a mill. The O'Connor mine is taking out splendid rock. The Allison Ranch has struck it rich. At the depth of 486 feet, on the incline, the main ledge is three feet thick, and is covered with free gold, besides being rich in sulphurets. In the lowest north drift the ledge shows well. The Cariboo ledge, supposed to be a feeder to the main ledge, is turning out the richest rock ever taken out in this district. The Cariboo is ten inches in thickness, and shows great flakes of gold. The office of the company, at the Ranch, is crowded with rich specimens of quartz from the Cariboo. The Harterey is paying for sinking, and a small dividend beside. The prospects are good. The Eureka and Idaho keep up their same old steady lick, giving no astounding items, but turn out big dividends. At Birchville not much is doing. Chinamen are working the opened claims, and are not making more than wages. There are many valuable unopened mining claims at and near Birchville. These will be worked to advantage when the tunnel now being run is completed. This is now in 3,000 feet, the end being 400 feet from the surface. A shaft is to be raised from the end of the tunnel. At Buckeye Hill the Evans & Stidger claims yield $16,000 to $18,000 for every 30 days' washing. At French Corral there are three cement mills (one a new one) of ten stamps each, running constantly, with profitable results. The cement claims at Empire Flat, one quarter of a mile from the Corral, are doing well. At Sebastopol the American Company is doing well, working with the hydraulic process. On San Juan hill two new companies have started up. The Eureka Lake Company is especially taking out good pay. At Badger Hill two companies are waiting for a tunnel to be completed. The English Company is doing well. The McDonald Company, at Grizzly Hill, has struck good gravel. The Chinamen bring in to Block & Furth, bankers, at San Juan, from $2,000 to $5,000 worth of gold dust per week. The Pennsylvania Company, which has not been worked for two years, is about to be started up again. When this lead was struck, for a long while it paid handsomely. It is the general belief that the Nebraska lead runs through these claims."

## Colorado.

COMSTOCK LODE—BOSTON SILVER MINING ASSOCIATION.

The Georgetown *Miner*, November 25th, in an article describing the mines and mills of the Smoke River district, Summit county, says of the Comstock lode and the operations of the above mentioned company: "This lode is situated on the west face of the mountain, and having visited it in 1866, shortly after it was discovered, when the indications of a large lode were very meagre, we take great pleasure in laying before our readers the following information in regard to its present state of development. A tunnel, one hundred and fifty feet in length, strikes the vein at a depth from the surface of one hundred and thirty feet. There are two adits on the vein—the upper one three hundred and fifty feet in length, and the lower one two hundred and eighty-one feet in length. A winze, ninety feet in depth, connects the two adits. As distance is gained to the southeast in the adits, great depth is gained on the mine from the surface. The whole number of feet sunk and driven on the Comstock is about nine hundred. One remarkable feature in regard to the mine is, that the workmen have developed no lean ground, and a gradual and constant increase in the width of crevice and mineral deposit from the surface to the present depth gained, is manifest in all the workings of the mine. On the surface the crevice is narrow, and the mineral deposit is from two to three inches wide. In the upper adit the crevice is four feet wide, showing a gradual increase in the mineral deposit, and in the lower adit the crevice is seven feet wide, and the average solid mineral deposit one foot wide. In one place, in the lower adit, the ore deposit, mixed with some gangue, is eight feet wide. The ore vein consists of gray copper sulphurets, argentiferous galena, zinc blende, and heavy spar. The timbering is solid and safe. All the 'mills' for the delivery of the ore from the stoping ground above to the floor of the adit are constructed at convenient distances. The ore and debris are brought out of the mine on a car to an ore-house, standing at the mouth of the tunnel, where the ore is sorted.

"A double-track tramway, seven hundred feet in length, extends from the ore-house to the base of the mountain, and the cars for delivering the ore have a capacity of about 2,500 pounds. The tramway should be extended to the reduction works, distant from the ore-house, at the base of the mountain, by the wagon road, about one-fourth of a mile, and the cost of hauling the ore in wagons avoided. The cost of feeding horses and mules hay and grain on Bear creek must be expensive.

"The reduction works of the Boston Silver Mining Association are situated on Bear creek, a tributary of South snake, in close proximity to the mine, and having an abundance of excellent timber for manufacturing lumber, and also for obtaining a full supply of fuel for many years near the reduction works.

"PROCESS.

"The ore is first submitted to the action of a Dodge crusher, and afterwards atomized by Cornish rollers, and then taken up by elevators to a large hopper, situated in the upper portion of the building, where it is screened, and then sent down to the Collum dresser and separator. The smelting and desulphurizing furnaces, the latter constructed with two chambers, one immediately above the other, are built on the Terrace plan, and all connected by flues, so that the flames from the furnace actually pass through the smelter and roasting furnaces to the smoke stack, which is connected with the upper chamber of the roasting furnace. The concentrated ore is introduced into the upper chamber of the roasting furnace, where it is stirred and moved gradually through both furnaces, and when desulphurized, into the smelter by means of rakes, invented and patented by John Collum Esq. The handles of the rakes are made of gas-pipe bent in the shape of the letter U, and to protect the rakes against the action of heat, a constant stream of cold water is forced through the tubular handles. By a simple and unique arrangement the handles are attached to the engine, and the proper forward and backward motion given to the rakes. The capacity of the reduction works is five tons per day. There is also a cupola furnace for treating slag.

"The lime used for fluxing is obtained from quarries which are found near the mouth of the Snake River, distant from the reduction works about ten miles. Not far from the lime quarries are soda springs, impregnated with iron and salt, where a valuable flux for smelting could be manufactured at a slight cost.

"The lead riches from these works are shipped to the reduction works of Ed. Balbach, Jr., Newark, N. J., for treatment, and a handsome margin of profits results to the association on the shipment of the lead alone. A good saw-mill, standing near the smelting works, is one of the admirable arrangements of the association. The mill buildings, boarding houses, offices, and other buildings are well constructed, and cover an area of six thousand eight hundred and twenty-nine square feet. There are over five hundred tons of choice ore mined out, and most of it hauled to the works, and one thousand cords of wood, cut and corded, up ready for use. We did not obtain any statistics in regard to the yield of the ore, as the Clerk and Superintendent were both absent. We shall chronicle some silvery reports in regard to the yield of lead riches from the Comstock next summer."

MISCELLANEOUS ITEMS.

The same paper says: "A new discovery, called the 'Terrific,' has been made in Virginia Canyon, by Silas C. Bennett, Esq., and others. The shaft is twenty feet deep, and the crevice four feet wide. The walls are well defined, and the deposit of quartz is large. We are inclined to think that a few more feet sunk on this lode will reveal good pay. Samples of quartz assayed by Prof. Sherman gave a yield of $40 in silver and $10 in gold.

"We understand that the Trenton Gold and Silver Mining Company will erect large reduction works at an early day next Spring, near their valuable mine, the Snowdrift lode. Their water-power on the north fork of South Clear creek is ample for driving heavy machinery, and we look forward with great interest to the time when we shall be able to announce the completion and successful operation of the above contemplated reduction works. The Snowdrift lode will be in splendid working condition by Spring.

"The first installment of dressed ore, thirty tons, treated at the dressing works of the Wilson & Cass Company, will be shipped East on Saturday of this week. Their works were erected under the superintendency of Prof. Julius Kurtz, who has made the subject of dressing ores a specialty. Complete success has crowned his long and arduous labors, and through him science and skill will render our vast lead resources available, and create the early necessity for the erection of smelting works in the vicinity of the coal mines, and the construction of a railroad to Georgetown. The dressed ore will be shipped to Newark, N. J., for treatment, at the reduction works of Ed. Balbach, Jr."

We take the following mining items from the Colorado *Herald*: "We saw a pile of ore at the Union Company's mine, on the Bates lode, the other day, which contained one thousand tons, and is worth $100 per ton. The California mine, Nevada, continues to yield an abundance of ore which averages eleven ounces per cord. Somebody will get rich off that mine yet, if they are not very careful. The Briggs mine is yielding some fine specimens of native gold. On Saturday evening a piece of ore weighing five or six pounds was taken out, which had a vein of almost pure gold running through it. The vein was about an inch wide, and the gold was in the shape of wire, making a perfect mat. As a natural curiosity the specimen is very valuable. It was discovered accidentally, and there must be several other fine specimens, as the manner in which the mass was broken shows that the part not found was equally as rich as that which happened to attract the attention of the miner."

## Montana.

THE MINING INTERESTS OF HELENA.

A correspondent of the Helena *Herald* thus reviews the mining interests centering at, and near Helena, under date Nov. 23: "No one not already conversant with the extent to which the business of quartz mining has been carried on could fail to be surprised, if not struck with admiration, by a visit to the mines in the vicinity of Unionville. This sprightly little village has grown out of, and depends for its existence upon, the successful working of the Union lead, which lies in an almost easterly and westerly direction, between Oro Fino and Grizzly gulches, on the border of a beautiful natural park, and some four or five miles south of Helena. Discovered in the spring of 1866, it has been worked to a greater or less extent from that time to the present with very satisfactory results. Several companies are at present industriously at work, with every appearance of remunerative returns. The original discovery claim, now owned by the 'Whitlatch Mining Company,' is being worked under the supervision of our energetic townsman, Capt. Charles Hendrie, who is said to be the largest shareholder in the company. And as his new twenty stamp mill is busy crushing ore from this claim, it is but just to infer that the dividends are forthcoming. East from Discovery, we are informed, but little labor has been done, and consequently the mine is comparatively undeveloped in that direction. Claim number one, west, the property of J. C. Ricker, and known as the I X L mine, is reported to be one of the best managed mines on the lead. The proprietor is a gentleman of unquestioned business talent, and has been successful in his mining operations under many difficulties. The 'National Mining and Exploring Company,' of New York, own claim No. 2, and judging by the great number of men employed and the constant running of their mill, the enterprise is, without doubt, successful. The entire business of the company is under the direction of their gentlemanly agent, Mr. Danforth. The adjoining claim is managed by Mr. Tatem, in the interests of the Columbia Mining Company. Mr. T. is a young man of very rare qualifications for his business. His mill at Unionville is now undergoing repairs, but the mine is in full blast. All of the above mentioned mines are well developed, and promise golden harvests for many years to come. But all this may be stale news to some who may chance to read it. To others, however, it will not be a 'twice told tale.' At all events, what we have mentioned are irrefutable facts, and should therefore be frequently submitted to the consideration of the public. Proceeding still westward from the claim of the Columbia Company, which is the limit of the Union lead, we notice, a few hundred yards distant, a more recently discovered, but none the less promising mine than the latter, belonging to Messrs. Whitlatch, Argyle & Maclure; their company name we cannot now recall. We are assured by reliable persons that the Parkinson lode, upon which these gentlemen are at work, is not only rich but permanent. Beyond the Parkinson mine, on Grizzly gulch, is the site of the I X L Company's mill. On the opposite side stands a comfortable and spacious but unassuming building, occupied as a general business office. There are several other buildings conveniently located for the accommodation of the men employed in the mine and mill, and also a fine, commodious barn. The I X L mill is in excellent working condition, and it is now running on rock from the company's mine. Near at hand, on the opposite side of the gulch, is the mill of the Diamond City Company. It is well built, has ten stamps, with a capacity for twenty, and is at present running on rock from the Park lead, with evidence of a good yield. On the same side of the gulch, only a short distance below, Mr. J. W. Whitlatch is preparing to erect a mill to crush the rock from his extensive mines on the Park lead, which is conveniently near, and upon which he has a strong force of miners at work. As he recognizes no criterion but success, we may look to see his new undertaking prove a prosperous one as usual. The mill is to be put up by Captain Hendrie, and it is expected to be ready for operation within thirty days."

## Pennsylvania.

THE COAL TRADE.

The Mauch Chunk *Gazette*, Dec. 9, says: "There was transported last week over both railroads and the canal, 81,827 07 tons, against 80,389 tons for the corresponding week last year—an increase of 738 07 tons. This is a falling off compared with the previous week of 40,000 tons, which is chiefly apparent rather than real, the report of the L. V. R. R. for the previous week having included eight days, up to November 30, the time when the official year of that company closed, leaving but four days' shipments to be included in the report of last week. So far as we can learn, the miners are accepting the heavy decline in prices, and the consequent reduction of their wages, as a thing unavoidable. It is getting to be understood among them that suspension places money into the pockets of the Schuylkill operators and miners, while they do not always profit financially to the producers of this region."

The Pottsville *Journal*, Dec. 11, says of affairs in the Schuylkill district: "The trade is very dull. There is scarcely any demand for any sizes of coal except egg and stove, and these at reduced rates for shipping, say $3 @ $3 25, according to quality, and $3 50 @ $3 75 for consumption on line and at Philadelphia. Several collieries have stopped, and one, we learn, has closed until March. The shipping by canal may be considered as over for the season. There are about thirty boats lying this side of the Blue Mountain dam that cannot pass, and some below. If the weather should become milder, these boats may be enabled to pass through, but even then we believe there will be no shipments unless on the line at points that may not be supplied."

The Scranton *Journal*, of same date, says of the recent serious fire-damp explosion which occurred at the Empire Shaft on Thursday morning: "Five men, named Thomas Carr, James Lewis, Charles Quinn, Wm. Jones, Luke Scanlon, were more or less injured. Carr was badly burned about the breast and face; Lewis had his leg broken; Quinn was pretty severely cut and bruised; Jones and Scanlon were slightly burned. The accident is said to have been the result of carelessness. The person who had last left the place on the previous evening left the door open and allowed the gas to accumulate."

## Arizona.

WICKENBURG.

The Prescott *Miner*, November 20th, has these items: "Recent news from Wickenburg is to the effect that the cylinder-head of the Vulture Mining Company's steam engine was blown from its position recently by the steam, and that in consequence the mill was lying idle. A new cylinder-head had been sent for, and it will not be long before the sound of the whistle and the thug of the stamps will again sound upon the ears of the Wickenburgers. Meantime, everything about the mill is being overhauled. This is the first time this mill has stopped over a day for several years. The little mill was also idle.

"The Jackson prospecting party brought home with them from their recent trip some of the richest-looking silver ores we have ever seen, and Col. Jackson showed us a piece of rock taken from a big ledge that crosses Salt River, which was chock full of free gold. The silver ores have been sent to San Francisco for assay. Should they 'develop' the white metal in as great quantities as the party expect, a big rush will be made for the district of country in which they were found, which lies between Salt River and the Gila, about sixty miles northwest of Florence."


## BUSINESS AND PERSONAL.

[*Short notices in this column fifty cents per line each insertion.*]

GLYNN'S ANTI-INCRUSTATION FOR STEAM BOILERS.—The only reliable article for removing and preventing incrustation. No foaming, and does not attack metals of boilers. Liberal terms to agents. C. D. FREDRICKS,
Dec. 21, tf. 587 Broadway, New York.

## MARKET REVIEW.

### The Coal Trade.

NEW YORK, Dec. 17, 1869.

WHOLESALE.—A general distrust yet prevails in the market, and the trade is noted as being very dull. There are in our estimation not over 20,000 tons of coal in the market at the present time, and with this amount to start with, there is no probability of lower prices for the balance of the year, and we do not see why parties who require coal are holding off.

We understand that the Scranton Company are delivering from 5,000 to 7,000 tons of coal per day from their docks at Elizabethport, and that in a few days the detention of vessels will no longer have to be complained of. This is good news indeed; and we hope we shall not be called upon again to find fault with the tardiness of this Company in filling orders for coal.

The trade has been a little exercised this week over two failures among the prominent retail dealers. In one case the liabilities amount to some $65,000. We have always contended that the system of credit among coal dealers was entirely too loose, and the credit generally too cheap. A party has only to hire two or three vacant lots, place a fence about them, erect a shanty on one corner of the same, borrow a couple of horses and carts, and deposit five hundred dollars in bank to be immediately able to get a large range of credit. In the case above noted the party was reported as entitled to about $3,000 credit only; yet we find in the list of his creditors one long established house allowing him $15,000. Now this is entirely wrong, and we think some steps should be taken to remedy the evil. Cannot our leading coal men in some way organize, and, by a strict set of rules and regulations, sift the trade of its unworthy members—men who frequently seek refuge in the coal business after defaulting in some other line. This is actually the character of men naturally encouraged, to the injury of sound and honest dealers, by a cheap line of credit. The correction of this evil would be the means of correcting many other evils which form just sources of complaint from consumers. We refer to short weights, misrepresentation of facts in regard to the quality of the coal sold, etc., all of which cast a shadow over even those upright men in the trade who in reality scorn to practice them. Let us commence at the fountain head and do business with only honorable and straightforward men. If the quality of coal offered by a wholesale dealer to the public is *so poor* that it fails to find a sale within a reasonable time among responsible dealers after it arrives in the market, so that, in order to save demurrage, he is willing to sell it to parties already bankrupt, it may be as well that the public should be made aware of the fact and its cause.

RETAIL.—Trade has been more active at the low rates ruling and noted in our last issue.

FREIGHTS.—Freights have taken an upward turn and may be quoted from 10 to 25 cents advanced.

In our last issue our compositors made some grievous and provoking errors in setting up the report of coal shipped over the Lehigh Valley Railroad for their year just ended. The figures should have been:

| | |
|---|---|
| 1869 | 2,015,296.11 tons. |
| 1868 | 2,225,630.02 |
| Decrease | 210,333.11 |

Also in a statement quoting from the *Miners' Journal*, we neglected to state that the figures given were for the amount of *Anthracite* coal carried only, via the Philadelphia & Reading Railroad for the year just closed. The following is the amount of Anthracite and Bituminous combined:

| | |
|---|---|
| 1869 | 4,148,054.17 tons. |
| 1868 | 3,508,376.06 |
| Increase | 639,678.11 |

The amount of coal sent via the Lehigh canal for season just closed is as follows:

| | |
|---|---|
| 1869 | 605,144 tons. |
| 1868 | 989,947 |
| Decrease | 384,803 |

The amount of coal sent South, via the Wyoming canal, for the season is:

| | |
|---|---|
| 1869 | 348,706 tons. |
| 1868 | 340,496 |
| Increase | 8,216 |

The following table exhibits the quantity of Coal passing over the following routes of transportation for the week ending December 11, 1869, compared with the same time last year:

| COMPANIES. | 1868. WEEK. | 1868. TOTAL. | 1869. WEEK. | 1869. TOTAL. |
|---|---|---|---|---|
| Phila. & Reading R.R. | | 3,687,682 | | 3,688,905 |
| Schuylkill Canal | 6,581 | 986,441 | 13,895 | 692,659 |
| Lehigh Valley R.R. | | 2,225,630 | | 2,015,296 |
| Lehigh and Sus. R. R. | 20,000 | 480,682 | 24,818 | 515,461 |
| Lehigh Canal | | 989,947 | 275 | 605,144 |
| Scranton North | 6,656 | 586 716 | 8,791 | 421,235 |
| " South | 18,025 | 1,046,132 | 30,563 | 1,069,917 |
| Penn. Coal Co., rail | 8,521 | 880,021 | 14,088 | 907,806 |
| " " " canal | | 29,035 | | 18,707 |
| Del. and Hudson, rail | | | 10,330 | 159,693 |
| " " " canal, north | | 1,640,118 | 616 | 1,205,280 |
| " " " south | | | 1,249 | 150,514 |
| Shamokin | 6,311 | 479,211 | 8 441 | 456,859 |
| Trevorton | 1,219 | 33,983 | 2,508 | 36,064 |
| Short Mountain | 1,811 | 121,915 | 2,408 | 104,642 |
| Lykens Valley Canal Co. | 1,180 | 84,639 | 1,249 | 78,313 |
| Huntingdon & Br'd Top | 4,971 | 261,215 | 6,881 | 343,357 |
| Wyoming South | | 340,489 | | 384,706 |
| " North | | 89,152 | | 76,308 |
| Williamstown, Col'y | | 178,467 | | 195,388 |
| Total | 75,275 | 13,540,849 | 127,762 | 13,491,014 |
| 1869 | | 13,491,014 | 75,275 | |
| Decrease year | | 49,835 | 52,487 | In. week. |

### Schuylkill Coal Trade.

Report of coal transported over the Schuylkill Canal for the week ending Thursday, December 9, 1869.

| From Port Carbon | Tons. Cwt. |
|---|---|
| " Pottsville | 6,871 02 |
| " Schuylkill Haven | 1,241 00 |
| " Port Clinton | 8,092 15 |
| | 690 00 |
| Total for week | 16,894 17 |
| Previously this year | 675,764 12 |
| Total | 692,659 09 |
| To same time last year | 986,446 02 |

Report of coal transported on the Philadelphia and Reading Railroad for the week ending Thursday, December 9, 1869:

| From | |
|---|---|
| St. Clair | 29,641 17 |
| Port Carbon | 6,452 13 |
| Pottsville | 3,858 05 |
| Schuylkill Haven | 19,167 19 |
| Auburn | 2,628 01 |
| Port Clinton | 9,672 11 |
| Allentown and Alburtis | 252 17 |
| Harrisburgh and Dauphin | 11,086 17 |
| Total paying freight | 82,779 00 |
| Coal for Company's use | 3,263 04 |
| Total for week | 86,042 04 |
| To same time last year | 37,218 16 |
| Total | 123,261 00 |
| same time last year | 54,963 10 |

### Lehigh Canal Coal Trade.

Shipped for the week Ending December 11, 1869.

| WHERE FROM. | WEEK. Tons. Cwt. | TOTAL. Tons. Cwt. |
|---|---|---|
| *Mauch Chunk.* | | |
| Lehigh Coal & Nav. Co. | | 189,079 04 |
| Summit Mines | | 3,366 14 |
| Room Run Mines | | |
| Total Mauch Chunk | | 192,445 18 |
| *Beaver Meadow.* | | |
| W. T. Carter & Co. | 179 02 | 15,089 06 |
| Spring Mount'n Coal Co. | | 5,073 09 |
| A. L. Mumper & Co. | | 18,823 11 |
| Honey Brook Coal Co. | | 35,768 06 |
| German Pa. Coal Co. | | 21,516 14 |
| Thomas, Hull & Co. | | |
| Other Shippers | | 1,842 11 |
| Total Beaver Meadow | 179 02 | 98,113 17 |
| *Mahanoy.* | | |
| McNeal Coal & Iron Co. | | 89 05 |
| Knc'k'r Anth't Coal Co. | | 98 10 |
| New Boston Coal Co. | | 236 17 |
| Delano Mines | | |
| Bedford & Cox | | 460 10 |
| Mount Etna Coal Co | | 437 06 |
| Coplay | | 1,203 10 |
| Glendon Coal Co. | | |
| Sherman Colliery | | 189 09 |
| Other Shippers | | |
| Total Mahanoy | | 2,705 07 |
| *Hazleton.* | | |
| A. Pardee | | 28,423 03 |
| G. B. Markle & Co | | 12,172 02 |
| Taggart, Butler & Co | | 109 10 |
| Buck Mountain Coal Co. | | 18,582 00 |
| Sharpe, Weiss & Co. | | 13,026 05 |
| Coxe, Brothers & Co | | 4,736 15 |
| Ebervale Coal Co | | 12,126 03 |
| Stout Coal Co | | 6,403 06 |
| Harleigh Coal Co | | 10,859 18 |
| Ashburton Coal Co | | 1,336 06 |
| Highland Coal Co | | 1,453 16 |
| Mount Hall | | |
| Jeddo Coal Co | | 2,974 12 |
| Pardee, Bros. & Co | | 2 992 11 |
| Sugar Loaf | | |
| Other Shippers | | 2,129 13 |
| Total Hazleton | | 118,126 00 |
| *Upper Lehigh.* | | |
| Upper Lehigh Coal Co | | 4,998 01 |
| Other Shippers | | 187 11 |
| Total Upper Lehigh | | 5,185 12 |
| *Wyoming.* | | |
| Newport Coal Co | | 91 14 |
| Valley Coal Co | | |
| Warrior Run Min. Co | | |
| Parrish & Thomas | | 11,938 12 |
| New Jersey Coal Co | | 6,007 04 |
| Preston Colliery | | |
| L. & S. Coal Co | | 9,962 03 |
| Germania Coal Co | | |
| Franklin Coal Co | | |
| Audenried Imp. & Coal Co | | |
| Wilkesbarre C. & I. Co | 95 14 | 75,703 09 |
| Union Coal Co | | |
| H. B. Hillman & Son | | 1,567 15 |
| Wyoming C. & T. Co | | 128 16 |
| Mineral Spring Coal Co | | |
| Henry Colliery | | 9,571 16 |
| Everhardt Coal Co | | 7,199 12 |
| East Boston Coal Co | | 4,323 13 |
| John Hort'n | | |
| J. H. Swoyer | | 2,315 09 |
| Shawnee | | 24,013 03 |
| Harvey Brothers | | |
| Del. & Hud. Canal Co | | 2,302 10 |
| Albrighton, Roberts & Co | | 3,739 03 |
| New England | | 3,475 18 |
| W. W. Lance | | 2,609 06 |
| Pine Ridge | | 4,519 19 |
| Nottingham | | 6,573 04 |
| Reynolds | | 4,503 14 |
| Maltby | | 386 06 |
| Gaylord | | 1,135 01 |
| Other Shippers | | 4,338 15 |
| Total Wyoming | 95 14 | 188 567 02 |
| Total Mauch Chunk Region | 179 02 | 192,445 18 |
| " Beaver Meadow " | | 98,113 17 |
| " Mahanoy " | | 2,705 07 |
| " Hazleton " | | 118,126 00 |
| " Upper Lehigh " | | 5,185 12 |
| " Wyoming " | 95 14 | 188,567 02 |
| Grand Total | 274 16 | 605,143 16 |
| Corresponding week last year | 274 16 | 989,947 05 |
| Increase | | |
| Decrease | | 384,803 09 |

### Report of Coal Transported over Lehigh Valley Railroad

For the week ending December 11, 1869, and previously this season, compared with same time last year:

| WHERE SHIPPED FROM. | WEEK. Tons. Cwt. | PREVI'S. Tons. Cwt. | TOTAL. Tons. Cwt. |
|---|---|---|---|
| Total Mahanoy | 7,513 04 | 7,020 10 | 14,533 13 |
| " Beaver Meadow | 10,366 10 | 8,744 13 | 19,111 04 |
| " Mauch Chunk | 32 19 | | 32 19 |
| " Upper Lehigh | | | |
| " Hazleton | 22,969 10 | 18,609 11 | 41,579 01 |
| " Wyoming | 9,342 05 | 7,391 17 | 16,734 02 |
| Total Anthracite | 50,224 08 | 41,766 11 | 91,990 19 |
| Bituminous Coal recv'd from Cata. R.R. | | | |
| N. C. R.R. | | | |
| E. P. R.R. | | | |
| P. & N. Y. C. & R.R. Co | | | |
| Fall Creek | | | |
| Schroeder | | | |
| Towanda | | | |
| Total by rail and canal | 50,224 08 | 41,766 11 | 91,990 19 |
| Same time last year | 23 366 06 | 44,252 06 | 66,618 11 |
| Increase | 27,858 02 | 2,485 14 | 25,372 08 |
| Forwarded East from M'h Chunk by rail | 46,607 19 | 39,156 06 | 85,764 05 |
| Same time last year | 20,580 14 | 35,344 10 | 55,925 04 |
| Increase | 26,027 05 | 3,811 16 | 29,839 01 |

RECAPITULATION.

| | | | |
|---|---|---|---|
| Forwarded East from M'h Chunk by rail | 46,607 19 | 39,156 06 | 85,764 05 |
| Delivered at M'h Chunk | 30 16 | 6 02 | 36 18 |
| Delivered on line of road above Mauch Chunk | 215 13 | 35 05 | 250 18 |
| Delivered above M. Chunk for use of L. V. R.R. | 897 10 | 514 01 | 1,411 11 |
| To N. C. R. R., at Mount Carmel | 115 00 | | 115 00 |
| Forwarded North from L. & B. Junction | 2,081 15 | 1,451 18 | 3,533 11 |
| To L. & S. R.R., at P'n Hav., for railroad | | | |
| Do. for canal | | | |
| Do. Packerton for rail | 96 13 | 126 14 | 223 07 |
| At M Chunk for canal | 179 02 | 476 07 | 655 09 |
| Total Anthracite | 50,224 08 | 41,766 11 | 91,990 19 |
| Bituminous Coal | | | |
| Total all kinds | 50,224 08 | 41,766 11 | 91,990 19 |

### Lehigh and Susquehanna Railroad.

Report of Coal Shipped South for the week ending Dec. 11, 1869.

| WHERE FROM | WEEK. Tons. Cwt. | TOTAL. Tons. Cwt. |
|---|---|---|
| Total Mauch Chunk Region | 10,737 17 | 237,385 15 |
| " Hazleton " | 135 15 | 123,656 03 |
| " Wyoming " | 14,058 11 | 77,261 17 |
| | | 785,463 08 |
| Grand Total | 24,933 03 | 1,222,777 03 |
| Corresponding week last year | 15,029 06 | 993,645 08 |
| Increase | 9,903 17 | 227,081 15 |
| Decrease | | |
| Forwarded South from Mauch Chunk | 23,888 15 | 856,068 04 |
| Delivered on line of Lehigh & Sus'na R. R., above Mauch Chunk | 533 10 | 33,401 05 |
| Delivered to Lackawanna & Bloom. R. R., at Plymouth Bridge | 415 04 | 18,839 19 |
| Delivered to Lehigh Valley R. R. Co., at Sugar Notch | | 5,151 03 |
| Delivered at Coal Port, for shipment by Canal | 95 14 | 305,316 12 |
| Total | 24,933 03 | 1,220.777 03 |

### Cumberland Coal Trade.

B. & O. RAILROAD.

The shipments over the Baltimore & Ohio Railroad for the week ending Dec. 11, 1869, were as follows:

From Cumberland & Pennsylvania R.R.

| | Tons. |
|---|---|
| Consolidation Co | 1,658 07 |
| Borden Co. | 3,265 06 |
| Balt. & Hampshire Co. | 20 06 |
| Midlothian Co. | 881 01 |
| From Eckhart R. R. | |
| C. C. & I. Co. | 827 00 |
| Total | 7,052 00 |

### Prices of Coal by the Cargo,

[CORRECTED WEEKLY.]

| | AT NEW YORK, Dec. 17. R. A. | W. A. | AT PHILADELPHIA, Dec. 16. R. A. | W. A. |
|---|---|---|---|---|
| SCHUYLKILL. | | | | |
| Lump | $— — | $6 00 | — — | 6 00 to — — |
| Steamer | — — | 6 00 | — — | 6 00 to — — |
| Broken | — — | 6 50 | — — | 6 00 to — — |
| Egg | 7 75 to 8 00 | 7 25 | — — | 6 50 to — — |
| Stove | 7 75 to 8 00 | 7 50 | — — | 6 50 to — — |
| Chestnut | 7 75 to 8 00 | 6 00 | — — | 6 00 to — — |
| Pea | — — | — — | — — | — — |
| LEHIGH. | | | | |
| Lump | — — | 7 10 | — — | — — |
| Steamer | — — | — — | — — | — — |
| Broken | — — | 6 60 | — — | — — |
| Egg | — — | 7 60 | — — | — — |
| Stove | — — | 8 10 | — — | — — |
| Chestnut | — — | 8 10 | — — | — — |
| Pea | — — | — — | — — | — — |
| SPECIAL COALS.* | R. A. | W. A. | | |
| Diamond Vein | $— — | $6 00 | — — | — — |
| New England | — — | — — | — — | — — |
| Locust Dale | — — | 8 00 | — — | — — |
| Honey Brook, Le'h | W. A. 6 25 to 7 50 | | — — | — — |
| Spring Mount | " " 6 25 to 7 50 | | — — | — — |
| Sugar Creek | " " 6 25 to 7 50 | | — — | — — |
| Sugar Loaf | " " 6 25 to 7 50 | | — — | — — |
| Fulton | " " 6 25 to 7 50 | | — — | — — |
| Stout | " " 6 25 to 7 50 | | — — | — — |
| Old Comp'y's | " " 6 25 to 7 50 | | — — | — — |
| Cross Creek | " " 6 25 to 7 50 | | — — | — — |
| Chauncey | " " 6 25 to 7 50 | | — — | — — |
| Girardville | " " — — | | — — | — — |
| McMichael | " " — — | | 6 00 to 6 50 | |
| Duncan | " " — — | | 6 00 to 6 50 | |
| Shamokin | " " — — | | 6 50 to 7 00 | |
| Lykens Valley | " " 7 50 | 6 50 | — — | — — |
| Broad Top | " " — — | 8 00 | — — | — — |
| Hill & Harris | " " — — | 5 00 | — — | — — |
| Henry Clay | " " — — | 7 00 | — — | — — |
| Powelton | " " — — | 7 00 | — — | — — |
| Burnside | " " — — | 6 50 | — — | 7 00 |
| BITUMINOUS COALS. | | | | |
| Kittaning Coal Co.'s Phœnix Vein f.o.b. at Phila. | | | | $5 25 |
| Lemon | | | | " 5 00 |
| Central C. & M. Co.'s | | | N. Y. | " 5 00 |
| Consolidated Coal Co.'s | | | | " 7 50 |

[*Dealers in these coals may be found in our advertising columns.]

### Company Coals.

| | L. | Str. | Grn. | Eg. | Sto. | Cst. |
|---|---|---|---|---|---|---|
| Scranton at E. Port | — — | — — | — — | — — | — — | — — |
| Pittston at N. Y | 6 30 | 6 30 | 6 40 | 6 40 | 7 25 | 6 10 |
| Lackawana at Weh'kn. | 5 50 | 5 75 | 6 00 | 6 00 | 6 75 | 5 50 |
| Wilk'b're at Hoboken. | 5 50 | 5 75 | 6 00 | 6 00 | 6 75 | 5 50 |
| Old Co. Lehigh at Pt. Johnston | 7 00 | 6 25 | 7 00 | 7 00 | 7 50 | 6 25 |
| Lehigh at E. Port | 6 50 | 6 00 | 6 00 | 7 00 | 7 50 | 5 50 |

For freights to different points, see "Freights."

### Prices for Coal at Mauch Chunk.

| | F.L. | Bro. | Gra. | Eg. | Sto. | Cst. |
|---|---|---|---|---|---|---|
| Lehigh | $4 00 | $4 25 | $4 50 | $4 50 | $4 75 | $4 00 |
| Wilkesbarre | 4 00 | 4 25 | 4 50 | 4 50 | 4 75 | $4 00 |

For freight to Elizabethport and to New York see "Freights."

### Prices of Foreign Coals.

December, 1869.

Duty $1 25 per ton.

Corrected weekly by PARMELE BROS., No 32 Pine street, New York.

| | |
|---|---|
| Liverpool Gas Caking | $9 50@— — |
| " " Cannel | 14 00@— — |
| " House " | 17 50@18 00 |
| " Orrel | 16 00@18 00 |
| Per ton 2,240 lbs., ex-ship. | |
| PRICES FROM YARD. | |
| Liverpool House Orrel, screened | $16 00@18 00 |
| " " Cannel, " | 18 00@19 00 |
| Per ton 2,000 lbs., delivered. | |

### Prices of Gas Coals.

December, 1869.

PROVINCIAL.

| Duty, $1 25. | Coarse. Gold. | Slack. Gold. |
|---|---|---|
| Block House | $1 75 | @- 75 |
| Gowrie | 1 75 | @- 75 |
| Lingan | 1 75 | @- 75 |
| Sydney | 1 75 | @- 75 |
| Pictou | 2 13½ | @- 71½ |
| Little Glace Bay | 2 13½ | @1 18¾ |
| Caledonia | 1 50 | @1 00 |
| AMERICAN. | 1 50 | @- 75 |

| | Coarse. Currency. | Slack. Currency. |
|---|---|---|
| Westmoreland Co. | — — | @- — |
| Despard Coal Co. | — — | @- — |
| Penn. | $8 50 | @8 00 |
| Newburg Orrel Gas | — — | @- — |
| West Fairmount Gas Coal | — — | @8 00 |
| AT PHILADELPHIA. | | |
| Powelton | | $7 50 |

### Prices at Baltimore—Dec 1869.

*Wholesale Prices to Trade.*

| | |
|---|---|
| Wilkesbarre, by cargo or car load | $7 50@8 00 |
| Pittston and Plymouth | 7 25@8 75 |
| Shamokin Red or White Ash | 6 50@7 00 |
| Lykens Valley Red Ash | 7 40@7 80 |
| Trevorton, Red Ash | — —@— — |
| By retail, per ton of 2240 lbs. delivered | 9 00@9 75 |
| Georges Creek & Cumberland f. o. b. at Locust Point for shipping | — —@6 50 |
| West Fairmount Gas f. o. b. | 4 85@5 00 |

### Prices at Georget'n, D.C., & Alexandria, Va.

December, 1869.

George's Creek and Cumberland f. o. b. for shipping..$4 75

### Prices at Havre de Grace, Md.

December, 1869.

| | |
|---|---|
| Wilkesbarre and other White Ash for cargoes | $— —@7 25 |
| Lykens Valley | — —@7 50 |
| Shamokin Red or White Ash | — —@7 50 |
| Trevorton and Zebra Valley | — —@7 25 |
| | — —@7 00 |

### Towing Rates.

TO EASTERN PORTS.

| To New Haven, | Per Ton. |
|---|---|
| Bridgeport, | $ 40 |
| Southport, | 40 |
| Westport, | 40 |
| Norwalk, | 40 |
| Stamford, | 40 |
| | 40 |
| Greenwich, | Per Boat. |
| Port Chester, | $70 00 |
| Mamaroneck, | 80 00 |
| Glen Cove, | 70 00 |
| New Rochelle, | 55 00 |
| East Chester, | 55 00 |
| West Chester, | 60 00 |
| White Stone, | 30 00 |
| College Point, | 30 00 |
| West Farms, | 25 00 |
| Flushing, | 25 00 |
| Harlem and Mott Haven, | 30 00 |
| Port Morris, | 20 00 |
| Ninety-first street and Astoria, | 20 00 |
| | 16 00 |

Boats beyond Port Chester, with less than 200 tons, $20 per Boat.

TO RIVER PORTS.

| To Manhattanville, Boats of 150—250 Tons. | Per Ton. |
|---|---|
| Spuyten Duyvil, | 9 cents. |
| Yonkers, | 9 " |
| Hastings, | 10 " |
| Piermont, | 12 " |
| Dobbs' Ferry, | 15 " |
| Nyack, | 15 " |
| Tarrytown, | 16 " |
| Sing Sing, | 17 " |
| Croton Landing, | 18 " |
| Haverstraw, | 19 " |
| Verplanck's, | 19 " |
| Peekskill, | 20 " |
| West Point, | 20 " |
| Cold Spring, | 21 " |
| Newburgh, | 21 " |
| Poughkeepsie, | 22 " |
| Rondout, | 22 " |
| | 23 " |

| To Manhattanville, and Return, Boats of 100 Tons | Per Boat. |
|---|---|
| Spuyten Duvvil, " | $12 00 |
| Yonkers, " | 14 00 |
| Sing Sing, " | 15 00 |
| Peekskill, " | 25 00 |
| | 25 00 |

### Freights.—DECEMBER, 1869.

| TO EASTERN PORTS. | From Philada. | From E. Port and Port Johnston. | From Newburg | From Rondout |
|---|---|---|---|---|
| Stamford | $2 00 | $1 25 | 95 | 95 |
| Norwalk | 2 00 | 1 25 | | |
| Bridgeport | 2 00 | 1 25 | | |
| New Haven | 2 00 | 1 25 | | |
| Hartford | 2 00 | 1 25 | | |
| New London | 2 75 | | | |
| Norwich | 2 00 | 1 45 | | |
| Mystic | 2 00 | 1 45 | | |
| Stonington | 2 00 | — — | | |
| Sag Harbor | 2 00 | 1 50 | | |
| Bristol | 2 00 | 1 35 | | |
| Newport | 2 25 | 1 50 | | |
| Fall River | 2 25 | 1 50 | | |
| Providence | 2 25 | 1 50 | | |
| Dighton | 2 25 | 1 50 | | |
| Warren | — — | — — | | |
| Pawtucket | — — | — — | | |
| New Bedford | 2 25 | — — | | |
| East Cambridge | 2 25 | 1 50 | | |
| Salem | 3 10 | — — | | |
| Newburyport | 3 10 | 2 00 | | |
| Portsmouth | 3 10 | 2 00 | | |
| Rockport | 3 10 | 2 00 | | |
| Saco | — — | — — | | |
| Portland | 3 25 | 2 00 | | |
| Bangor | 3 25 | 2 00 | | |
| Bath | 3 25 | — — | | |
| Middletown | 3 25 | 2 00 | | |
| Amesbury | — — | — — | | |
| Boston | 3 25 | — — | | |
| Cambridgeport | 3 10 | 2 00 | | |
| Taunton | 3 10 | — — | | |
| Derby | 3 10 | 2 00 | | |
| New York | 2 00 | — — | | |
| Hackensack | 1 55 | 60 | | |
| Jersey City | 1 75 | — — | | |
| | 1 65 | 60 | | |
| TO RIVER PORTS. | | | | |
| Troy | — — | — — | | |
| Albany | — — | — — | | |
| Coeyman's | — — | — — | | |
| Stuyvesant | — — | — — | | |
| Cocksackie | — — | — — | | |
| Hudson | — — | — — | | |
| Catskill | — — | — — | | |
| Poughkeepsie | — — | — — | | |
| Fishkill | — — | — — | | |
| Cold Spring | — — | — — | | |
| Haverstraw | — — | — — | | |
| Nyack | — — | 50 | 45 | 55 |
| Sing Sing | 1 60 | 50 | 55 | 55 |
| Yonkers | 1 60 | — — | 60 | 50 |
| New York | — — | 40 | 60 | 50 |
| Saugerties | — — | — — | | |
| Rhinebeck | — — | — — | | |
| Rondout | — — | — — | | |
| Tarrytown | 1 60 | 80 | 60 | |
| West Point | — — | — — | | |

### Foreign and Provincial Freights.

December, 1869.

| *Foreign.* | |
|---|---|
| Newcastle and Ports on Tyne | £15@£17 keel |
| Liverpool | 1s. —. do |

TO NEW YORK.

| *Provincial* | |
|---|---|
| Sidney | |
| Lingan | $3 25 |
| Cow Bay | 3 25 |
| Port Caledonia | 3 25 |
| Little Glace Bay | 3 25 |

TO BOSTON.

| | |
|---|---|
| Sydney | |
| Lingan | $2 75 |
| Cow Bay | 3 75 |
| Port Caledonia | 3 25 |
| Little Glace Bay | 3 00 |
| | 2 25 |

### Rates of Transportation to Tide Water.

*BY RAILROAD.*

TO PORT RICHMOND, PHILADELPHIA.

Philadelphia and Reading Railroad, from Schuylkill Haven

From Port Carbon, 8 cents per ton more. $2 50

TO ELIZABETHPORT.

| | |
|---|---|
| L. V. Railroad from Mauch Chunk to Easton | $1 15 |
| C. R. R., N. J., Easton to Elizabethport | 1 70 |
| Shipping expenses at Elizabethport | 25 |
| Total | $3 10 |

TO PORT JOHNSON.

| | |
|---|---|
| L. V. R. R. | |
| C. R. R., of N. J. | $1 15 |
| Shipping expenses | 1 80 |
| | 25 |
| Total | $3 20 |

TO HOBOKEN.

| | |
|---|---|
| L. V. R. R. | |
| Morris & Essex R. R. | $1 15 |
| Shipping expenses | 1 80 |
| | 25 |
| Total | $3 20 |

TO SOUTH AMBOY.

| | |
|---|---|
| L. V. R. R. | |
| R. & D. R. R. | $1 15 |
| Cam. & Am. R. R. | 1 10 |
| Shipping Expenses | 50 |
| | 25 |
| Total | $3 00 |

*BY CANAL.*

### Via Schuylkill Canal.

TO PHILADELPHIA.

| | |
|---|---|
| From Schuylkill Haven | |
| " Port Carbon | $1 70 |
| " Port Clinton | 1 70 |
| TO NEW YORK. | 1 70 |
| From Schuylkill Haven | $2 20 |

### Via Lehigh Canal.

TO PHILADELPHIA.

| | |
|---|---|
| Lehigh Canal | |
| Freight and towage | $1 |
| Total | 1 [illegible] |

TO NEW YORK.

| | |
|---|---|
| Lehigh Canal | |
| Morris " | $ 71 |
| Freight | 85 |
| Towing | 1 70 |
| | 10 |
| Total | $2 29 |

TO JERSEY CITY.

| | |
|---|---|
| Lehigh Canal | |
| Morris " | $ 71 |
| Freight | 95 |
| | 1 60 |
| For re-shipment | 3 26 |
| | 30 |
| Total | $3 56 |

### Via Delaware and Raritan Canal.

TO NEW YORK.

| | |
|---|---|
| Lehigh Canal | |
| Delaware Division Canal | $ 71 |
| Delaware and Raritan Canal | 43 |
| Freight | 57 |
| Towage | 1 45 |
| | 20 |
| Total | $3 36 |

TO NEW BRUNSWICK.

| | |
|---|---|
| Lehigh Canal | |
| Delaware Division Canal | $ 71 |
| Delaware and Raritan Canal | 43 |
| Freight | 57 |
| | 1 20 |
| Total | $2 91 |

For Re-shipment—30 extra for shipping, and 10 cents drawback.

## METALS.

IRON.—Duty: Bars, 1 to 1¼ cents ₱ lb; Railroad, 70 cents ₱ 100 lbs.; Boiler and Plate, 1½ cents ₱ lb; Sheet, Band, Hoop, and Scroll, 1¼ to 1¾ cents ₱ lb; Pig, 9 ₱ ton; Polished Sheet, 3 cents ₱ lb.

| | |
|---|---|
| Pig, Scotch No. 1, ₱ ton | 33 00@36 00 |
| Pig, American, No. 1 | 39 00@39 00 |
| Pig, American, No. 2 | 36 —@37 — |
| Pig, American, Forge | 33 —@35 — |
| Bar, Refined, English and American | 85 —@87 50 |
| Bar, Swedes, assorted sizes (gold) | 82 50@85 00 |
| | *Store Prices.* |
| Bar, Swedes, ord'y sizes, less 5 ₱ ct | — —@140 — |
| Bar, Refined " " " | 95 —@100 — |
| Bar, Common " " " | 87 50@ 90 — |
| Scroll " " " | 120 —@130 — |
| Ovals and half-round " " " | 120 —@145 — |
| Band " " " | 120 —@ — — |
| Horse Shoe " " " | 120 —@ — — |
| Rods, ⅜ to 3-16 inch " " " | 100 —@155 — |
| Hoop " " " | 125 —@150 — |
| Nail rod, less 5 ₱ ct | — 8¼@— 9¼ |
| Sheet, Russia, as to Nos. (gold) | — 11—@—12— |
| Sheet, Single, D. and T. Common | — 5¼@— 7 |
| Sheet, Galvanized | List 15@25 ₱ cent, discount. |
| Rails, English (gold), ₱ ton | 56 50 @57 00 |
| Rails, American, at Works in Pa | 76 00 @77 00 |

STEEL.—Duty: Pig, Bars and ingots, valued at 7 cents ₱ lb or under, 2½ cents; over 7 cents and not above 11, 3 cents ₱ lb; over 11 cents, 2½ cents ₱ lb, and 10 ₱ cent ad val. (Store prices.)

| | |
|---|---|
| English Cast (2d and 1st quality) ₱ lb | — 16 @— 20 |
| English Spring (2d and 1st quality) | — 7 @— 10 |
| English Blister (2d and 1st quality) | — 11 @— 18 |
| English Machinery | — 11½@— 14 |
| English German (2d and 1st quality) | — 13 @— 15 |
| American Blister "Black Diamond" | — 10½@— 16 |
| American, Cast, Tool do. | — 19 @— — |
| American, Spring, do. | — 10 @— 13 |
| American Machinery, do. | — — @— 13 |
| American German, do. | — 10 @— 13 |

COPPER.—Duty: Pig, Bar, and Ingot, 5; old Copper cents ₱ lb; Manufactured, 45 per cent. ad val.

| | *All Cash.* |
|---|---|
| Copper, New Sheathing, ₱ lb | — @— 32 |
| Copper Bolts | — @— 33 |
| Copper Braziers, 16oz. and over | 33 @— 35 |
| Copper Nails | 38 @— 40 |
| Copper, Old Sheathing, &c., clean | — @— 19 |
| Copper, Chili Pig | — @— — |
| Copper, American Ingot | 21¼@— 21½ |
| Yellow Metal, New Sheating | — @— 27 |
| Yellow Metal Bolts | — @— 27 |
| Yellow Metal Nails | — @— 27 |

LEAD.—Duty: Pig, $2 ₱ 100 lbs.; old Lead, 1½ cents ₱ lb; Pipe and Sheet, 2½ cents ₱ lb.

| | |
|---|---|
| Galena, ₱ 100 lbs | $— — @— — |
| Spanish (gold) | 8 20 @6 30 |
| German, do. | 6 20 @6 37½ |
| English, do. | 6 25 @6 75 |
| Bar (net) | 8 37½@— — |
| Pipe and Sheet (net) | 8 37½@— — |

TIN.—Duty: Pig, Bars, and Blocks, 15 ₱ cent. ad val.; Plate and Sheets and Terne Plates, 25 ₱ cent. ad val.

| | *Gold ₱ lb.* |
|---|---|
| Banca | 35 @36 |
| Straits | 33 @— |
| English | 30½@30¾ |

PLATES.

| *Fair to Good Brands.* | *Gold.* | *Currency.* |
|---|---|---|
| I. C. Charcoal, ₱ box | $8 00 @8 37½ | $10 50 @11 00 |
| I. C. Coke | 6 75 @7 37½ | 8 75 @10 00 |
| Coke Terne | — — @6 00 | — — @ 8 00 |
| Charcoal Terne | 7 50 @8 00 | 9 75 @10 50 |

SPELTER.—Duty: In Pigs, Bars, and Plates, $1 50 ₱ 100 lb.

| | *Gold.* |
|---|---|
| Plates, Foreign ₱ 100 lbs. | $6 — @6 25 |
| Plates, Domestic ₱ lb. | — 9 @— 12 |

REMARKS.

IRON.—There is very little inquiry for either Scotch or American Pig, and prices remain as previously noted. The sales are 300 tons Eglinton at $33 cash and $34 50 time, and 300 do. Gray Forge on private terms. Wrought scrap is in moderate request at steady prices; 400 tons sold, part at $40 from yard. New Rails are in moderate request at $56 50 @ $57 gold for English, and $76 @ $77 currency for American at the works in Pennsylvania; we notice sales of 1,500 tons 50 lb. English on terms not made public. Bar continues dull at our quotations for lots from dealer's hands—from first hands there is little doing, and there are no invoices offering—the price of Refined in Philadelphia is $82 50 ₱ ton.

COPPER.—The manufactures of Copper and Yellow Metal are steady at our quoted rates. Ingot is still dull and depressed. There is no speculative inquiry, and manufacturers' wants, as usual at this period of the season, are very light. The business has been confined to 125,000 lb. Baltimore and Lake Superior at 21¼c. @ 21½c. Old Copper may be quoted 18 @ 19c.

SPELTER.—The market for Foreign remains very quiet, and we hear of no sales; the nominal price is 6¼c. gold. We notice a new domestic article from the American Zinc Works, at Elizabethport, which is represented to be chemically pure; it is selling at 10c. @ 11c. as to quantity.

LEAD.—There has been more business in Pig, but at prices in buyer's favor; sales have been made of 100 tons Spanish at $6 25; 50 do. $6 20 gold; and 50 do., Refined do., on private terms. Old Lead sells at 7c. cash. Bar, Sheet, and Pipe are still selling at 8½c. net cash.

TIN.—There is scarcely any inquiry for Pig, and prices are quite nominal; we have only to notice sales of 5 tons English at 30½c. gold; and 5 do. at a private price. Plates are also very dull, and the market is without buoyancy; 200 boxes assorted Charcoal Tin sold at $8 12½ for I C.; and 150 do. Charcoal Terne, $7 25 gold.

STEEL.—There is no change to report; demand moderate.

ZINC.—American, dry, 8½c.; French, dry, 12c.; French, metallic, 13½c.

MANGANESE—5½c. per lb.

### Mining Stocks.

NEW YORK, Dec. 16, 1869.

The market in mining stocks has again quieted down, with prices a shade lower than last week's. We note the following sales: 500 Liberty at 2c.; 600 Quartz Hill at 70, 100 at 68; 100 Smith & Parmelee at $1 65; 300 Gregory at $1 60; and 200 Benton at 12c. Nye gold is quoted at 2c., and Crozier at 3c.

Petroleum stocks continue to advance in price. We note sales of 1,000 Buchanan Farm at 42, and 200 Rynd Farm, seller 3, at 40c.

The following is the latest report of prices in the city:

| | *Bid.* | *Asked.* |
|---|---|---|
| Bennehoff | — | 50 |
| Brevoort | 1 60 | 1 70 |
| Buchanan Farm | 40 | 43 |
| Home Petroleum | 6 75 | 8 00 |
| Central | 71 | 75 |
| New York and Alleghany | 1 20 | 2 50 |
| National | — | 2 00 |
| United States | 81 | 82 |
| Northern Light | 65 | 90 |
| United Petroleum Farms | 20 | 21 |
| Rynd Farm | 40 | 45 |
| Pithole Creek | 1 60 | 2 00 |
| Bergen Coal and Oil | — | 40 |
| Second National | 50 | — |
| Rathbone Oil | 20 | — |
| Union | — | — |

### San Francisco Stock Market.

SAN FRANCISCO, December 15, 1869.
(By Telegraph.)

| | *1st Board.* | *2d Board.* |
|---|---|---|
| Savage | 48 | 48½ |
| Crown Point | 20½ | 19½ |
| Yellow Jacket | 46 | 44¾ |
| Kentucky | 1 41½ | 1 45 |
| Chollar Potosi | 20 | — |
| Gould & Curry | — | — |
| Ophir | 13¾ | 13½ |
| Alpha | 18½ | 19 |
| Belcher | 16½ | 16½ |
| Imperial | 41 | — |
| Hale & Norcross | 1 46 | 1 50 |
| Amador | — | — |

## The Cost and the Way to Obtain a Patent to a Mine.

WE promised some time since to give a list of the various fees, under the Mining Law of the United States, charged by the Surveyor, the Register of the Land Office, and the printer, for performing necessary services in preparing a mining claim for a patent. Although the fulfillment of our promise has been delayed, we are enabled to keep it to the reader and the owners of mines at last.

The following statement, except in the cases of the Register and printer, was prepared by Mr. Thomas J. Read, United States Deputy Surveyor. It points out each item of cost, as well as the different steps to be taken from the first to the last, by which the applicant for a patent may measure both the time and money reqnired to perfect his title to a mine.

| | |
|---|---|
| Jan'y 1.—Preliminary survey, and making out diagrams and notices, about | $60 00 |
| " 2.—Post notice and diagram. | |
| " 2.—Application to Register, whose fee for copying notices and diagram of survey is | 20 00 |
| " 3.—First publication of notice, cost for 90 days | 72 00 |
| April 3.—Cost of affidavits relating to posting notice and publication | 4 00 |
| " 3.—Application for final survey. | |
| " 9.—Final survey and report by the U. S. Deputy Surveyor, and maps from the Surveyor General's office | 70 00 |
| " 20.—Payment for land at $5 per acre (where 100 feet of surface ground on each side of the lode is claimed, 218 feet in length will make an acre.) When the payment for the land has been made, the Register issues a duplicate receipt, which is equivalent to a patent. | |
| " 20.—Register's fee for making copies of notice, diagram, and affidavits, to forward to General Land Office | 10 00 |

Commencing on the first day of January, the applicant for a patent to a mine may receive the "duplicate receipt" from the Register, which fixes the validity of his title, in less than four months. If the mine is situated in a remote district, beyond the regular lines of communication, longer time will be required; but, unless the title is contested by a counter claimant, six months would be deemed a fair allowance of time for the different steps required. The total cost for the services specified in the statement, allowing one acre of ground for the mine to be patented, is $241. This sum may be regarded as the average cost of procuring a mine. The items in the sum are expressed in currency, except those for the publication of the notice in the newspaper and the preliminary survey, which are in coin.

After reading this statement, the claimant of a mine may see his way clearly to an absolute title from the owner of the public domain—the United States Government. Of course, his mine has been the subject of more or less work, by which he may be satisfied it possesses value; and he ought not to hesitate to incur the additional expense required to establish its title. Unless he should take this last step, all the labor and money which he has expended on his mine—which may actually be a valuable vein or deposit of gold, silver, or copper—may finally go for nought. He does not know the day when his mine may be "jumped" by some of those nefarious characters which infest every mining district. And if the unpatented claim should develop a stratum or body of excellent ore, it has no protection against the all-pervading cupidity, and the only course that the original claimant can take is to go to law. He may have satisfied all the conditions of the local regulations, and developed his mine to the extent of thousands of dollars, and yet he may lose it because he cannot meet the great expense of litigation; or he may lose it through the inscrutable perversity of the jury. This is not fanciful, for the very thing has happened again and again in this immediate district.

There is but one safe course for the claimant of a mine, and that is to procure a patent under the beneficent law of Congress. Possessed of that indisputable title, the miner may hold his property; or he may sell it readily to the man of capital, if it will pass examination. The patent will be *prima facie* evidence of the estimation in which it was held. As an investment for the hard-working miner, whose business is beset with peril—as a resource for the "dark day"—a patented mine offers the prospect of larger and more certain reward than any other thing on the coast. We should like to see every good mine in every district in this State—and their number may be expressed by thousands—held securely by the patent of the United States.—*Nevada Reveille.*

## MINING COMPANIES AND STOCK QUOTATIONS.

| GOLD AND SILVER COMPANIES. | SITUATION OF MINE. | SECRETARY AND PLACE OF BUSINESS. | CAPITAL. | PAR VALUE. | OFF'R'D. | ASKED. |
|---|---|---|---|---|---|---|
| Alameda Silver | | A. Queran, 108 Wall st | $2,000,000 | $10 00 | | |
| Ada Elmore | South Boise, Idaho | | | | | |
| American Flag | Nevada District, Col | P. P. Fullerton, 71 B'way | 600,000 | 10 00 | 12 | |
| Atlantic and Pacific | Humboldt Co., Nevada | | | | | |
| Bates and Baxter | Colorado | | | 50 00 | | |
| Benton | Colorado | W. F. Drake, 15 Broad | 500,000 | 5 00 | 12 | 12 |
| Briggs | Colorado | J. P. Davies, 19 Cliff | 1,000,000 | 100 00 | | |
| Black Hawk | Colorado | C.T. Whittington, 48 Broad | 2,500,000 | 100 00 | | 40 |
| Bobtail | Colorado | J. Stanton, Jr., 25 Nassau | 1,000,000 | | | |
| Bullion Consolid'ed Gold | Colorado | | | | | |
| Burroughs Gold | Colorado | | | | | |
| Church Union Gold | California | | | | | |
| Consolidated Gregory | Colorado | | | | | |
| Combination Silver | Nevada | | | 100 00 | 1 50 | 1 60 |
| Columbia Silver | Austin, Nevada | J. M. Brown, 155 B'way | 5,000,000 | | | |
| Commercial Silver | | J. E. Smith, 26 Pine | 3,000,000 | | | |
| Corydon | Gilpin Co., Colorado | J. Samuels, 40 B'way | 500,000 | | | |
| Downieville | Colorado | | 2,500,000 | 25 00 | | |
| Eagle Gold | Gold Dirt Dist., Col | J. P. Davies, 19 Cliff | 300,000 | 1 00 | | |
| Empire Gold and Silver | BodieBluff, MonoCo. Cal | H. K. Gates, 70 B'way | 1,000,000 | | | |
| Edgehill | | A. Fullerton, 71 B'way | 10,000,000 | | | |
| Esperanza Silver | | Ezra Clark, Jr., 13 William | 400,000 | | | |
| Fisk Gold | | H. Johnson, 195 Fulton | 500,000 | | | |
| Forest Queen | | E. B. Beet, 62 B'way | 1,000,000 | | | |
| Golconda Gold | Sherbrooke, C. E | H. Adams, 71 Broadway | 2,000,000 | | | |
| Gregory | Colorado | | 1,250,000 | | | |
| Gunnell Gold | Colorado | J. H. Rolston, 80 B'way | 1,000,000 | 50 00 | | |
| Gunnell Central | Colorado | C. B. Bostwick, 16 B'way | 3,000,000 | 10 00 | | |
| Gold Rock | | R. M. Lockwood, 93 Wall | 400,000 | | | |
| Grass Valley | | | | | 23 | 25 |
| International Silver | | J. W. Brazier, 26 Pine | 600,000 | | | |
| Hope Gold | Colorado | | 5,000,000 | | | 10 |
| Holman | | | 2,000,000 | 25 00 | | 3 |
| Kipp & Buell | Colorado | | 300,000 | | | |
| Knickerbocker Gold | | J. H. Rolston, 80 B'way | 200,000 | 100 00 | | |
| La Crosse Gold | Nevada Dist., Col | P. P. Fullerton, 71 B'way | 1,000,000 | | | |
| Lander Hill T. & S | Nevada | M.L.Catherwood, 74 B'way | 1,000,000 | | | |
| Lewis Gold | Georgia | | 1,000,000 | | | |
| Liberty Gold | | | | | 2 | 3 |
| Manhattan Silver | Nevada | M. L. Ogden | 400,000 | | | |
| Maraposa common | California | Jas. H. Ferdon, 34 Wall | 12,000,000 | | 7½ | 8 |
| Mariposa preferred | California | do. do. | | | 15¼ | 15¾ |
| Montana Gold | | G. De Cordova | 400,000 | | | |
| Montana M. L. & M. Co. | Montana | A. M. Hoyt, 22 William | 250,000 | | | |
| Montrose | Clear Creek Co., Cal | W. W. Perkins, 71 B'way | 1,000,000 | | | |
| New York Silver | Nevada | Thos. Sproull, 78 B'way | 1,500,000 | | | |
| New York and Austin | Nevada | E. R. Siccomb, 70 Wall | 500,000 | | | |
| New York and Owyhee | Owyhee Co., Idaho | | 1,000,000 | | | |
| New York and Eldorado | | G. H. Munroe, 10 Wall | 2,000,000 | | | |
| N. Y. & Montana M. & D. | Montana | F. A. Chapman, 20 Nassau | 1,250,000 | | | |
| N. Y. & Silver Peach | Nevada | R. C. Root, 74 B'way | 2,000,000 | | | |
| N. Y. & Utah P. & M | | W. H. Mailler, 108 Wall | | | | |
| Ophir Gold | Comstock Lode, Nev | L. C. Warner, 70 B'way | 625,000 | | | |
| Owyhee Gold | | W. H. Smith, 43 Ex. Place | 1,700,000 | | | |
| Pahranagat Central | Nevada | J. E. Smith, 25 Pine | 6,000,000 | | | |
| Quartz Hill Gold | | F. Bernard | 2,500,000 | | 2 55 | 2 65 |
| Reese River Consol'd | Nevada | W. B. Ogden | 6,000,000 | | 67 | 69 |
| Rocky Mountain | Colorado | S. M. Pond, 70 B'way | 500,000 | 10 00 | 5 | 10 |
| Rollins Gold | | Thos. Bond, 132 B'way | 600,000 | | | |
| Sensenderfer | Colorado | H. A. Shewill, 19 Broad | 1,000,000 | | | |
| Silver Bend | | F. W. Macy, 20 Nassau | 1,500,000 | | | |
| Silver Mt. Silver | | H. A. Moen, 71 B'way | 1,000,000 | | | |
| Silver Peak & R. M | Nevada | W. B. Ogden, 52 Wall | 5,000,000 | | | |
| Smith & Parmelee | Colorado | W. H. Hollister, 6 Broad | 2,500,000 | 20 00 | 1 60 | 1 70 |
| Social & Steptoe Con | | T. H. O'Connor, 24 Nassau | 450,000 | | | |
| Standard Gold | | C. B. Bostwick, 169 B'way | 500,000 | | | |
| Symonds Forks | | | | | | |
| Twin River Silver | Nevada | J. F. R. Hadden, 20 Nassau | 800,000 | 100 00 | | |
| Texas Gold | Colorado | | 500,000 | 10 00 | | |
| Union Gold | Colorado | F. A. Potts, 110 B'way | 1,200,000 | | | |
| Wash. Mill & Silver | Nevada | W. W. Perkins, 71 B'way | 300,000 | | | |
| Wauba Yuma | Arizona | J. W. Sisby, 36 Pine | 6,000,000 | | | |

| COAL AND IRON COMPANIES. | SITUATION OF MINE. | SECRETARY AND PLACE OF BUSINESS. | CAPITAL. | PAR VALUE. | OFF'R'D. | ASKED. |
|---|---|---|---|---|---|---|
| American Coal Co | | M. A. Myers, 119 B'way | $1,500,000 | $25 00 | | |
| Ashburton Coal Co | | J. T. Rollins, 41 Pine | 2,500,000 | | | |
| Block House Coal | | D. B. Keeler, Jr., 43 Pine | 1,000,000 | | | |
| Brewster Iron | | H. Robison, 165 B'way | 150,000 | | | |
| Broad Top Coal & Iron Co | Pennsylvania | B. Love | 2,000,000 | | | |
| Cameron Coal Co | | J. A. Simpson, 40 B'way | 2,500,000 | | | |
| Carbon Hill Coal Co | | J. Silsby, 36 Pine | 1,000,000 | | | |
| Central Coal | | F. P. White, 111 B'way | 2,000,000 | 100 00 | | |
| Clifton Iron Co | | P. H. Riordan, 34 Pine | 1,250,000 | | | |
| Columbia Iron | | E. D. Webb, 77 Cedar | 1,000,000 | | | |
| Consolidation Coal | Maryland | J. S. Mackie, 71 B'way | 5,000,000 | | | |
| Crawford Coal | | E. Clapp, Prest, 137 B'way | 1,000,000 | | | |
| Cumberland C. & I. Co | | E. Kiscan, 90 B'way | 5,000,000 | | 26 | 26½ |
| Derby Coal Co | | W. S. Davison, 11 Broad | | | | |
| Dover Coal and Iron Co | | L. Chase, 88 Wall | | | | |
| Del. & Hudson Canal Co | | | 10,000,000 | 100 00 | | |
| Ebervale Coal | | G.L Stout, Treas., 111 Br'y | 500,000 | | | |
| Fall River Bituminous | | D. T. Blauvelt, 43 Pine | 1,000,000 | | | |
| Farrar Coal | | C. H. Jones, 43 Pine | 250,000 | | | |
| Fisher Iron Co | | M. Ellis, 19 William | 100,000 | | | |
| Hamp're & Balt. Coal | | S. M. Pond, 70 B'way | 500,000 | | | |
| Iron Cliffs Co | | C. J. Canda, 52 Wall | 1,000,000 | | | |
| Jackson Iron | | G. P. Loyd, 119 B'way | 300,000 | | | |
| Kemble Coal & I. Co | | R. A. Wight, 26 Ex. Place | 300,000 | | | |
| Keokuk Coal | | J. F. Franklin, 112 B'way | 100,000 | | | |
| Lackawanna I. & C | Pennsylvania | E. C. Lynde, 52 Wall | 1,200,000 | | | |
| Lewis Run C. & I. Co | | C. A. Sanborn, 80 B'way | 750,000 | | | |
| Lykens Val. Coal Co | | F. A. Platt, 13 William | 800,000 | | | |
| McKean Co. Bit. Coal Co. | | J. H. Rolston, 80 B'way | 1,500,000 | | | |
| Lehigh & Susquehanna | | | | | | |
| Mahanoy | | | 400,000 | 100 00 | | |
| McNeal C. & I. Co | | C. C. Godwin, 71 B'way | 500,000 | | | |
| Mount Riga Iron | | G. M. Newton, 42 Cedar | 300,000 | | | |
| New Boston Coal | | C. H. Ogden, 55 B'way | 2,000,000 | | | |
| N. Y. Con. C. & I. Co | | A. T. Levine, 16 Wall | | | | |
| N. Y. & Lehigh Coal | | T. Simpson, 111 B'way | 150,000 | | | |
| Pacific Coal Co | | G. Wrighton, 34 Wall | | | | |
| Peekskill Iron Co | | W. Murdock, 7 Nassau | | | | |
| Pennsylvania Coal Co | | C. H. Mead, 111 B'way | 3,200,000 | 50 00 | | |
| Richmond Iron Co | | C. H. Smith, 165 B'way | 1,000,000 | | | |
| Scotia Coal Co | | I. N. Soper, 42 B'way | 2,500,000 | | | |
| Spring Mt. Coal | | C. Runyon, 111 B'way | 1,250,000 | | | |
| Springfield & D'p Run C. | | E. D. Webb, 77 Cedar | 600,000 | | | |
| Stout Coal Co | | G. S. Comstock, 111 B'way | 500,000 | | | |
| Susquehanna & Wyoming | | E. Potter, 40 B'way | 1,000,000 | | | |
| Tannerdale Coal | | I. T. Ludlaw, 71 B'way | 250,000 | | | |
| Wash. Mutual Coal | | M. C. Baker, 117 B'way | 420,000 | | | |
| West Point Iron Co | | R. C. Brock, 110 B'way | 500,000 | | | |
| Wilkesbarre C. & I. Co | | W. H. Tillinghast, 80 Br'y | 3,400,000 | | | |
| Wyoming Val. Coal Co | | E. Potter, 40 B'way | 1,000,000 | | | |

| COPPER AND LEAD COMPANIES. | SITUATION OF MINE. | SECRETARY AND PLACE OF BUSINESS. | CAPITAL. | PAR VALUE. | OFF'R'D. | ASKED |
|---|---|---|---|---|---|---|
| Anita Copper | California | J. A. Ferguson, 8 Wall | | | | |
| Corinth Copper | Corinth, Vermont | S. H. Howard, 191 B'way | $500,000 | 25 00 | | |
| Davidson Copper | | | | | | |
| Eagle Harbor Copper | Michigan | W. H. Smith, 43 Ex. Place | 500,000 | 25 00 | | |
| Evergreen Bluff Copoer | Michigan | F. W. Caper, 44 Ex. Place | 500,000 | 25 00 | | |
| Globe Copper | | R. K. Rickard, 19 Nassau | 200,000 | | | |
| Grand Portage Copper Co | | A. S. Kellogg, 22 Pine | 500,000 | | | |
| Guymard Lead | | Samuel Vernor, 38 Pine | | | | |
| Hilton Copper | | W. H. Smith, 43 Ex. Place | 500,000 | | | |
| Hope Copper | | J. W. Davis, 19 Nassau | 500,000 | | | |
| Hudson River Copper | New York | T. Clarkson, 22 William | 1,500,000 | | | |
| Indiana Copper Co | | J. M. Mills, 25 Nassau | 500,000 | | | |
| Isle Royale Copper | Michigan | F. W. Caper, 44 Ex. Place | 1,000,000 | | | |
| Keweenaw Copper | Michigan | F. W. Caper, 44 Ex. Place | 500,000 | | | |
| Lake Superi'r Silver Lead | Michigan | A. S. Kellogg, 22 Pine | 1,000,000 | | | |
| Omiga Copper | Michigan | S. Cooper, 7 Pine | 500,000 | | | |
| Ridge Copper | Michigan | J. L. Gardiner, Jr., 43 Ex. P | 500,000 | | | |
| Rockland Copper | Michigan | A. Fullerton, 71 B'way | 500,000 | | | |
| St. Joseph Lead | Michigan | J. W. Jones, 6 Broad st, | 1,000 000 | | | |
| St. Marguret Copper | | E. P. Sutton, 43 Pine | 250,000 | | | |
| Schoolcraft Copper | | R. Walsh, 22 William | 500,000 | | | |
| Superior Copper | Michigan | A. Fullerton, 71 B'way | 500,000 | | | |
| Union Copper | | A. S. Kellogg, 22 Pine | 500,000 | | | |
| Vermont Copper | Vermont | J. C. Fly, 191 B'way | 500,000 | | | |
| Wallkill Lead | | S. M. Pond, 70 B'way | | | | |

| MISCELLANEOUS. | SITUATION OF MINE. | SECRETARY AND PLACE OF BUSINESS. | CAPITAL. | PAR VALUE. | OFF'R'D. | ASKED. |
|---|---|---|---|---|---|---|
| American Zinc Co | | W. E. Lawton, 19 Cliff | $1,000,000 | | | |
| Bigelow Blue Stone Co | | H. Bogardus, 14 Pine | | | | |
| Quicksilver | | | | | 15¼ | 16 |
| Covill B. L. M. & M'f. Co | | C. R. Bostwick, 302 Pearl | 250,000 | | | |
| Manhattan Marble | | H. K. Gates, 70 B'way | 300,000 | | | |
| N. Jersey Zinc Co | New Jersey | A. H. Farlin, 61 Malden L'e | 1,500,000 | | | |

### British American Railway Routes.

The Journal of the British Royal Geographical Society for 1868 contains, together with much other interesting matter concerning recent explorations in all quarters of the world, a memoir by A. WADDINGTON, Esq., on "The Geography and Mountain Passes of the Columbia, in connection with an Overland Route," illustrated with an admirable map. The immediate subject of this paper is the proposed British Pacific Railway, from the north shore of Lake Superior, via Rainy Lake, Lake of the Woods, Assiniboine and Saskatchewan Rivers, to the Rocky Mountains, thence through the range in Lat. 53° to the head of Frazer's River, down that river, and across to Homocaco River, and so to the head of a long arm of Queen Charlotte Sound, on the Pacific Coast. There are eight passes which have been explored through the Rocky Mountains, on British Territory, leaving out the Athabasca Pass by Peace River, in Lat. 56° 28', as being too far north for the purpose under consideration :

| Names of the Passes. | —Ridge or Divide— Lat. Deg. | Long. Deg. | Alt. Feet. |
|---|---|---|---|
| 1. Yellow Head Pass, from the Athabasca to the Upper Frazer (Rae) | 52.54 | 118.33 | 3760 |
| 2. Howes Pass, from Deer River, to the Upper Columbia | 51.57 | 117.07 | 6347 |
| 3. Kicking Horse Pass, by Bow River and Kicking Horse River, to the Upper Columbia (Sullivan) | 51.16 | 116.32 | 5420 |
| 4. Vermillion Pass, from S. Saskatchewan by Ft. Bow (4100 ft.) to Kootanie (Hector) | 51.06 | 116.15 | 4947 |
| 5. Kananaskis Pass, from Fort Bow, by Ramsay River, to the Kootanie (with a short tunnel 4600 feet) (Palliser) | 50.45 | 115.31 | 5985 |
| 6. Crow's Nest Pass, by Crow River to Kootanie | 49.38 | 114.48 | .... |
| 7. British Kootanie Pass, by Railway Riv. to the Kootanie (Blakiston) | 49.27 | 114.57 | 5960 |
| 8. Red Stone Creek, or Boundary Pass, from Waterton River to the Kootanie (partly on American ground) (Blakiston) | 49.06 | 114.14 | 6030 |

The Yellow Head Pass in the above table is comparatively straight and short, and the last three are tolerably so, but too near the boundary line to be available ; the four others describe the most circuitous routes, among a labyrinth of glaciers, and mountains covered with perpetual snow. Besides which, the approach to them over the plain by the South Saskatchewan is for nearly 100 miles through an arid, sandy, treeless district, forming the northern limit of the great American Desert, instead of the rich, fertile belt drained by the north branch, which is also the more considerable one of the two. And it is in the very latitude of this belt that the great barrier of the Rocky Mountains is cleft asunder, so that the road runs along this fertile zone in a direct line up to the lowest and easiest pass, as to a natural gateway leading to the Pacific.

For these reasons, Mr. WADDINGTON decides in favor of the Yellow Head Pass, which is still further recommended by the circumstance that it connects with the route via the Upper Frazer to the Bute Inlet trail, cutting through the Cascade Mountains by a deep valley, studded with rich bottoms. The formidable Cascade range can be thus passed, without the necessity of rising more than 2500 feet above the sea, or employing violent grades. Bute Inlet is one of the numerous arms of the great system of land-locked waters skirting the coast of Washington and British Columbia. Many of these terminate abruptly, like the fiords of Norway ; others are too far Northwest to be convenient termini of a railway ; and the North Bentinck Arm, by Milbank Sound, which is the only rival of Bute Inlet in this regard, is said to possess decided disadvantages in comparison with the latter, having no good harbor, and requiring a road connecting with it from the interior to climb a difficult pass, and traverse an ugly swamp. The advantages of the Bute Inlet Route consist in its central position, fine town site and harbor, or rather its two harbors, accessible at all seasons of the year, its easy and safe connection with Victoria and the ocean, and the proximity of the coal mines at Nanaimo. There is also safe and easy inland navigation to Victoria, 185 nautical miles distant.

Mr. WADDINGTON seems to have established the feasibility of constructing a Pacific railway by the line indicated, and of operating it during the greater part of the year, at least. It remains doubtful, however, whether such a road is necessary, or could be made profitable. The Northern Pacific railroad of the United States is likely to be built first ; and this would prove a formidable competitor for all through travel. It is probable that the British road would secure only the slow development of some fine agricultural valleys, and the empty satisfaction of the patriotism of the English colonists, who desire a railroad under their own flag. The first of these results would be indefinitely delayed by the opening up, along the American railroad, of equally inviting regions, under the far more liberal conditions of the homestead and territorial laws of the United States. The contrast between the free lands, popular government and enterprising spirit which characterize the new territories of this Republic, and the sluggish and restrictive regime of the English colonies, does not fail of its effect upon the minds of settlers. The present condition of affairs in the Red River country may serve as an illustration. Meanwhile, the march of events is likely to obliterate entirely the advantages of the second result, above mentioned. It is not impossible that, before our British cousins shall have succeeded in completing a railway wholly within their own domain, the American flag may float over that domain. The best thing for them (and us) is to select the desired northern transcontinental route on grounds of engineering practicability, financial economy and commercial advantage, leaving patriotism out of the question. The capital that would otherwise be wasted in the construction of unnecessary parallel lines, might with greater wisdom be spent upon north and south roads, auxiliary to one great, central trunk.

We think, if national jealousies were laid aside, there would be far less trouble in determining the proper route. Of all the inlets that indent the coast ranges, there is not one to be compared for size, navigability and convenience, or for the extent and value of the country which it penetrates, with the Columbia River. Of all the passes through the formidable Cascade range, there is not one so perfectly adapted for human use as the mighty chasm through which that river flows majestically to the sea. Of all the northern routes across the continent, there is none so admirably suited for a railroad as the great plateau on which American engineers have just surveyed the line for a Pacific railway.

The American road would satisfy the necessities of British America. Even in case of war, it would be quite as easy for the British to capture a road a little on *our* side of the boundary line, as to defend one, a little on their own side. But a war is not likely ; and common sense demands a geographical and topographical, not a political, settlement of this important commercial problem.

### Recent American Inventions.

A NEW Dry Concentrator, the invention of Mr. KROM, is at present being tried in Colorado. The invention is, in fact, a pneumatic jigging hutch. Instead of water it is air that is forced up through the jigging sieve, in successive impulses, given by means of a bellows, and, theoretically, since heavy objects fall quicker in air than in water, the blows can be more rapidly repeated, and the amount of work done be proportionately increased.

A Mining Pan, which is likely to prove at once economic and efficient, is now being constructed in San Francisco, by Mr. A. Moore, of San Rafael. The experimental trial has been most encouraging. Cubes of rock of the size of one or one and a-half inches, fed into a hopper which surmounts the central portion of the pan, are readily reduced to a degree of fineness suitable for ordinary pan work. The discharge of this grinder or crusher is so made that the sand will pass directly beneath the mullers, as in ordinary pans, where it is subjected to the ordinary amount of trituration, and thoroughly amalgamated. When this process is completed, the pan may be charged with a suitable quantity of water to act as a settler ; and when ready for the "clean up" the mullers are readily run up by a screw cut upon the central shaft, so as to be entirely out of the way of the charge and the operator. By opening plugs in the ordinary way, the water, after being settled, is drawn off, and the sediment and amalgam removed, as from ordinary settlers. The dies and mullers are of peculiar construction, so as to secure a full and effective trituration and circulation of the pulp. In addition to the mullers, and immediately over the periphery, there is a circular groove, in which is placed a series of balls, of about thirty pounds weight, and extending entirely around the circumference of the pan. By the action of the pan these balls are set in motion, and, it is claimed, add greatly to the triturating powers of the pan. It is designed to operate the pan upon a framework of wood, which, it is claimed, is so secured and braced as to make it full and strong, and as little liable to get out of order as though it were constructed of iron; while it can be built at much less cost, and more cheaply transported. In a timber country the frame can be got out and put together upon the ground, thereby securing an important saving in both cost and transportation. This pan is the result of much experience and experiment in the separate use of the grinder and the pan ; and the inventor, who is a thoroughly practical man, is quite sure he has produced a combination of the two, with a settler, which will greatly reduce the cost of machinery in a quartz mill ; and at the same time provide the prospector with a cheap and effective mill, which he can readily move from point to point, as he may desire for giving thorough practical tests to veins without the great expense attendant upon the erection of experimental mills.

The model of Collin's Oscillating Quartz Crusher, exhibited at the Industrial Fair, is creating a good deal of attention among miners, and an admirable description of it has been published in the *Mining and Scientific Press*. The machine is very simple in construction, and the crushing is produced by the oscillation of an iron wheel, under a pressure of several hundred times its own weight, on an iron bed-plate, walled up on either side, so as to take the form of a trough, open at both ends. The quartz is fed, first upon one end of this trough, and then upon the other, while the wheel is made to alternately pass over the same. A suitable devise is affixed, to remove all the quartz from either end, immediately after each passage of the wheel, discharging it into a rotary screen, which deposits that reduced sufficiently fine into one apartment, whilst the coarser finds its way, automatically, into another, from whence it may be again elevated, automatically or otherwise, to the feed platform. By this arrangement no power is uselessly expended on work that is fully completed ; an entire new charge of quartz being presented for every movement of the wheel. The power required to drive the wheel is reduced to its minimum by an ingenious use of anti-friction rollers. The crushed mass can be reduced to any degree of fineness by the employment of finer or coarser screens. If the practical observer will imagine the above-described operation, which is even more simple than ordinary stamps, he will have precisely what is shown in this model, divested of its automatic feed attachment. The crushing of a piece of quartz by causing a heavy wheel to pass over it on an even iron floor, is probably the most economical use of power in that direction which can be devised. The cause of the failure of this principle, as applied to the ordinary Chilian mill, is owing to the practical difficulties in the way of effecting a ready discharge. The devise of Mr. COLLINS appears to have provided a full and efficient remedy for this defect.

The loss of the valuable metal in the process of wet-crushing, is a cause of almost constant complaint, but the machine devised by Mr. PARTZ, of Oakland, appears to have overcome the difficulty altogether. His method of wet-crushing without loss is exceedingly simple, and little or no concentration is necessary down to the process of amalgamation in the pan. He merely uses the same water over and over again, which is pumped back to the stamp mill. The advantages of amalgamation in battery for separation of coarse gold are thus first reaped ; then the pulp flows into tanks (intermediate blankets or other concentrating contrivances, not necessarily interfered with) of a number of compartments, in which the ore separates and sizes itself into as many qualities as may be desired. When one set of compartments gets filled with amalgamation matter, the other is used, and the contents of the first are worked up in the pans. As it has been found that float gold will disengage the particles of air or water gas which make it buoyant, when heat is applied to 100° Centigrade, Mr. PARTZ next conducts a steam-pipe into the tank, to heat up the material before amalgamation, effecting thereby, besides, the well-known chemical acceleration of the application of heat in the various succeeding processes.—*Nevada Correspondence of London Mining Journal.*

### Mining Education in Prussia.

The Royal Prussian School of Mines in Berlin appears to be making very satisfactory progress, the number of students attending the courses for this session being upwards of 70, including Austrians, North Americans, and Englishmen. During the first year the student is instructed in mathematics, experimental chemistry, experimental physics, mineralogy, palæontology, general smelting processes, and drawing. In the second year the courses include mining, smelting, salt manufacture, general analysis, blow-pipe analysis, metallurgical technology, surveying and dialling, mechanics, miners' and surveyors' drawing, geognosy, petrography, mineralogical practice, and *viva voce* examination upon mineralogical subjects. And in the third and last year the lectures are upon the principles of machinery and machine construction, mineral analysis and mineral chemistry, analysis of iron, chemical technology, geology, and mining laws. During the summer session the lectures commence at 7 o'clock in the morning, and continue almost uninterruptedly until 6 o'clock or 7 o'clook in the evening, but in the winter session they are one hour later both in commencing and closing. Iron smelting is taught by Bergrath Dr. Wedding, who has had the opportunity of studying the various processes carried on in all the principal iron-making districts, whilst the mining chair is entrusted to Bergrath Hauchecorne ; that of chemical technology, blow-pipe, and general analysis, etc., to Prof. Kerl ; metallurgical analysis to Dr. Dürre ; mineral chemistry to Dr. Rammelsberg ; mineral analysis to Dr. Finkener ; mechanics and machinery to Dr. Hörmann ; and other subjects to equally competent instructors, so that there need be no misgivings as to the quality of the instruction obtainable at the school. Yet the fees payable are quite trifling in comparison with those we are accustomed to in England (the English fees, by the way, being so exorbitant that but few of those to whom a mining school education would be useful are able to pay them), and many of the courses are entirely free. The charge for attending the mining lectures, which occupy five hours per week, is (5 thls.) 14s. 6d. for the winter session, and (4 thls.) or less than 12s. for the summer session ; general analysis is taught for six hours per week for (9 thls.) £1 6s. for the half-yearly session, and the other courses are equally cheap. The advantages of the school are thus placed within the reach of all, and the institution is made to render a full return to the country for the amount of State support which it receives.—*London Mining Journal.*

### Discovery of Mines in India.

Very extensive discoveries of valuable mines in the Himalayas have lately been made by Mr. Calvert, formerly an officer of the Eastern Bengal Railway Company, The products include silver, lead, antimony, zinc-blende, copper, and some gold. One mine at Shigri, on the old boundary of Northern India, is described as an enormous lode, in which the ore is several feet thick and solid. The others are principally in the Vazeeri Rupi (the Silver country of the Vazeers), a name it was long known by, being so described in the maps as part of Kirloo (Long. 77, Lat. 32, north.) The mines are situated near the River Parbatti, having plenty of water-power close at hand, and are in the midst of forests of pine. The discovery is said to have created a sensation, not only on account of their being the first discovered in the locality, but also for their richness in the precious metals. It is proposed to form a company in England to work them. All the produce can be disposed of in India, the railway being but a few marches off.

### Saginaw Salt.

THE first salt operations in the Saginaw region were commenced in 1856, a company, called the East Saginaw Manufacturing Company, having been organized, and the first wel being completed in March, 1860. The first salt was made in July, 1860. The following summary shows the amount of salt manufactured each year since the business commenced : 1860, 4,000 barrels ; 1861, 125,000 ; 1862, 243,000 ; 1863, 466,000 ; 1864, 529,073 ; 1865, 477,200 ; 1866, 407,997 ; 1867, 474,721 ; 1868, 555,690 ; 1869, 577,569 barrels.

The following statistics, prepared November 1st, 1869, contain the salt business for the year : Number of companies in operation, 50 ; number of blocks, 119 ; kettles, 4,178 ; solar covers, 4,304 ; grainers, 128 ; acres of land covered, 9,500 ; amount of money invested, $2,432,500 ; salt made in 1869, 577,569 barrels ; men employed, 781 ; value of barrels used, $225,026.

THE ENGINEERING AND MINING JOURNAL.

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ROSSITER W. RAYMOND, Ph. D., Editor.

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## The Sulphur Deposit of Louisiana.

Prof. EUGENE W. HILGARD, of the University of Mississippi, communicated to the American Association, and now publishes in SILLIMAN'S JOURNAL, a summary of results of a late geological reconnoisance of Louisiana, undertaken for the New Orleans Academy of Sciences. This paper contains a description of the celebrated artesian wells of Calcasieu, which, in substance, is as follows:

These wells are located in two small islands in the freshwater marsh at the head of Bayou Choupique, a small tributary of the main Calcasieu River. It was long known that on one of these islands there existed "tar springs," which had formed an asphaltum pavement on a portion of the surface, and continually evolved combustible gas. Not long after the close of the war, boring operations were commenced there by the Louisiana Petroleum and Coal Oil Co., and at the time of Prof. HILGARD'S visit, a depth of 1,230 feet had been attained. Another boring, on an island about 700 yards to the westward, under the charge of Dr. KIRKMAN, of Lake Charles, had reached a depth of 450 feet.

The Louisiana well presents the following profile, according to information believed by Prof. HILGARD to be trustworthy. Beginning at the surface, there are 160 feet of blue clay, with some layers of sand, soaked with petroleum. This the Professor assigns to the Port Hudson group. Below it are 173 feet of loose sand and gravel, belonging to the Orange Sand Group; then 50 feet, 10 of gray, laminated clay, and 40 of blue, sandy, nodular limestone, with marine shells, petroleum, and gas, ascribed to the Vicksburg group. Under this again, and beginning at the depth of 383 feet from the surface, comes the cretaceous formation, continuing to the bottom of the well. This commences with 60 feet of soft, crumbling, crystalline limestone, underlain by 100 feet of pure, crystalline sulphur. At 543 feet, gypsum begins to alternate with the sulphur; at 650 feet there is a five foot layer of pure sulphur, and at 680 another, 10 to 15 feet thick. Below 690 feet, the boring passes through dense, granular gypsum only.

KIRKLAND'S well at 450 feet, seems to be still in the Orange sand, and has not reached any sulphur. The oil-bearing stratum is the Vicksburg group. As soon as this was penetrated in the Louisiana well, there was a violent rush of combustible gas, and water mixed with petroleum. The amount of the latter, however, never exceeded a few barrels a day, even when the pump was used; and great difficulty was found in passing through the loosely-piled, rounded lumps of blue limestone, which kept tumbling in from the sides. No fresh supply of oil was found after reaching the white limestone. The inconsiderable thickness of the Vicksburg rocks, and the fact that they are frequently traversed by valleys of denudation, tends to discourage the expectation that they will be found the reservoir of petroleum in paying quantity. The water now flowing from the Company's well, at the rate of 65 gallons per minute, with a pressure of 12 feet, is a saturated solution of sulphuretted hydrogen, with a little gypsum and common salt. It comes chiefly from the surface of the sulphur bed.

Prof. HILGARD remarks of the cretaceous rocks penetrated by this well:

"As to the underlying white limestone, it is a material utterly foreign to any of the Tertiary groups of the Southwest, while coinciding precisely with some of the limestone of the saliferous cretaceous outliers of North Louisiana; here again, chemical as well as microscopic characters coincide as strikingly as they differ from those of the blue oil-bearing rock.

"For the immense *sulphur bed* underlying, we have no direct precedent, unless it be the occurrence of a sulphur-bearing earth in the gypsum formation on Delaware creek, on the southern border of the Llano Estacado, observed by Captain POPE. But the interstratification of sulphur and gypsum in the lower bed proves the closeness of their mutual relation, while the enormous thickness of the underlying gypsum bed recalls at once the great gypsum formation of the upper Red river, and the Llano Estacado; faintly represented by the gypsum beds of North Louisiana and Arkansas.

"The age of the great gypsum formation has been the subject of much discussion. It has always seemed to me that the great extent of the area over which the cretaceous beds and underlying gypsum are known to be co-extensive, went far to prove that they belonged substantially to the same epoch. Whatever weight may attach to this argument is greatly enhanced when we find the cystalline limestone and underlying gypsum not only reappearing in northern Louisiana, but actually accompanying each other beneath the waters of the Gulf of Mexico. Whether the volcanic agencies which even now so frequently disturb that great basin, have been instrumental in reducing the sulphur, distilling the petroleum, and crystallizing the rock salt of southern Louisiana, may be more profitably discussed when more extensive excavations shall have given us an opportunity of closer inspection of the facts. As regards the sulphur bed, it seems strange that no such opportunity is as yet foreshadowed in the near future; although in my view, its practical importance can hardly be over-estimated. Its development requires, it is true, large capital and the best of engineering resources, in view of the depth, and peculiar difficulties of drainage and ventilation. But who that knows the part sulphuric acid plays in modern civilization, the monopoly enjoyed by Sicilian sulphur, the burdens naturally and artificially imposed upon its production in that island, and the inferiority of the acid prepared from pyrites, can fail to appreciate the intrinsic importance of a bed of pure sulphur some one hundred and thirty-five feet thick, lying at a depth less than half of that at which some coal mines are profitably worked in Pennsylvania; and within ten miles of ocean navigation! The very gangue of the mineral—gypsum—is of sufficient value in agriculture and the arts, to bear shipment for thousands of miles, within the country. Nor, indeed, is it likely that beds *of such magnitude* should be confined to a limited area, and not be accessible at more advantageous locations."

As we have already informed our readers, this deposit of sulphur is to be exploited by regular mining operations. The sinking of a shaft in such ground as the profile of the borings indicates will be a work of some difficulty and expense; but there are no insuperable obstacles in the way, and the reward which awaits a successful development is immense.

## The Loss of Gold in Stamp Mills.

THE Colorado mine-owner, whose statistics of loss in the stamp mill we published two weeks ago, writes us again, saying that the character of his ore is "much the same as the other Colorado gold ores;" that the process employed is merely crushing under stamps, with quicksilver in the batteries, the ore from thence passing over shaking tables coated with quicksilver; that the loss of quicksilver is not excessive; that the tailings do not appear to contain more than perhaps a third of the missing gold; and that efforts to concentrate sulphurets have not been successful.

Repeating our former explicit disavowal of the notion that we can solve the problem of this mysterious loss for our correspondent, we still venture to suggest one or two points which may put him on the track of finding out the evil, if not the remedy.

In the first place, the lack of proper precautions in sampling and assaying frequently leads to mistake concerning the amount of gold actually in the ore. The gold which exists merely in the certificate of assay cannot be "saved" by any known process! This is safe ground to start with.

Again, the assays of tailings, where tailings are deposited from still water, ought to show the whole amount lost; but tailings deposited, as is frequently the case in Colorado, from running water, may have lost part of their gold. This can take place in two ways. Fine gold is swept away, floating in the water, as all mill-men are well aware; but it is not so generally known that gold is soluble in water containing salts of the peroxide of iron; and such salts might possibly be present in sufficient quantity in cases where mine-waters are employed in the mill, or the water from one mill is used again in another. The result would be a loss of gold, which would not be found in the tailings. We do not know that any experiments have been made in Colorado to settle this question; but it is reported that the mines of Virginia were troubled with a loss of gold from this cause. Professor WURTZ, we believe, first pointed out the principle. It should be borne in mind as a source of possible trouble in other operations besides the ordinary stamp-process. If ores are roasted, for instance, as they are said to be in HAGAN'S furnace, and the sulphates are leached out of them with hot water, we should think gold would be found in the leach. But the quantity may be very small in such a case. It might become considerable, however, if a running stream of the solvent were constantly acting on the auriferous material.

The carelessness or direct dishonesty of employees is a frequent cause of loss in stamp-mills; and the declaration that the process will only extract so or so much is a most convenient excuse. Mill-owners should make it a rule that no loss can be assumed without showing where it takes place. A loss there certainly is, in the rapid and imperfect process employed; but it is not "mysterious"; and a competent superintendent ought to be able to track it up, and determine its necessary extent.

In the case before us, the fact that no excessive loss of quicksilver takes place, may be regarded as an indication that there is no great loss of gold in amalgamated form, by stealing or otherwise. The gold, therefore, which fails to appear in the "clean-up" has probably never been amalgamated. Perhaps it was not in the ore; but more probably it has been carried away in the rush of water which battery-amalgamation and shaking-tables involve.

A very feasible and promising experiment (if any of our companies had the patience to carry it out) would be to crush the ore, without any amalgamation, running the mill at topmost speed and collecting the pulp in a reservoir, where it could settle quietly; to leave it there for six months, turning a hose on it now and then, to facilitate decomposition, but not exposing it to strong currents; and finally, to work the ore in pans. Possibly the cost of crushing might be lessened enough in this way to pay for the extra handling; while, in most sulphuretted ores, the yield from amalgamation would be largely increased.

Some of these topics will be more fully treated in the report of the Commissioner of Mining Statistics.

## New Publications.

THE CATALOGUE OF OFFICERS AND STUDENTS *of Columbia College, for the Year* 1869–1870, *being the one hundred and sixteenth since its foundation.*—This catalogue does not include the School of Mines; and the list of students, numbering in four classes only 129, is painfully out of proportion to the magnificent array of distinguished names of officers and instructors. The reason for this discrepancy it is beyond our power to divine. The advantages offered by Columbia College, whatever they may have been in the past, can at present scarcely be excelled in the way of means and men; nor, in spite of much newspaper discussion of the matter, do we discern signs of weakness in the management. The much-criticized liberality of the discipline, approximating the system of foreign universities, even if it were detrimental to the welfare of the institution, could not be expected to diminish the number of students. Probably it is in vain to look for the causes of the small attendance at Columbia in any of its present peculiarities. It takes a good while to destroy the prestige of a college; and it takes a good while to build it up again. Columbia fell a little behind, perhaps, in the race of improvement; and she cannot recover at a bound what she was so long a-losing.

Dr. HERMANN CREDNER, of the University of Leipzig, sends us a copy of a recent article on the pre-Silurian rocks of the upper Michigan peninsula. Dr. CREDNER combines a thorough European training with a personal knowledge of American localities; and his observations are highly valuable, as serving to correct the errors of observers with merely local experience. We shall publish, from time to time, translations of some of his interesting and acute discussions of American geology.

To Hon. JOHN JAY KNOX, Deputy Comptroller of the Currency, we are indebted for copies of the Annual Finance Report, and the Report of the Director of the Mint. The latter will be made the subject of more particular comment.

Royal Berghauptmann BRASSERT, of Bonn, sends us an interesting *brochure* by Privy Councillor BURKART, of the same place, on the Mining Law of the United States. The basis of the article is the second Report of Commissioner J. Ross BROWNE. This is a new proof of the interest with which foreign nations are studying the mining industry of this country.

The Report of the Commissioner of the General Land Office, for 1868, for a copy of which we are indebted to Prof. A. R. ROESSLER, is quite late in making its appearance. It is a volume of 421 pages, and, as usual with the public documents that come from Mr. WILSON'S office, contains a good deal of information of value. There is no reason, we think, why the varied contents of such a work should not be made more useful to the public by the addition of a proper analytical index, and to this point we would call Mr. WILSON'S attention. A good many facts are hidden in the mass of his report and the accompanying documents, which it requires a deal of patience to fish out. The notes of Prof. HAYDEN, United States Geologist, concerning the Missouri valley and the Territories of Wyoming and Nebraska, are both interesting and trustworthy; and we shall have occasion to refer to them hereafter. On the whole, the Report of 1868 is one of the most valuable that have been issued from the Land Office.

SILLIMAN'S JOURNAL for November is an unusually rich and interesting number. The leading article, on the Earliest Discovery in America, from the pen of HENRY STEVENS, is admirably written, and illustrated with several large fac-similes of ancient charts. Prof. HILGARD'S Reconnoissance of Louisiana contains a description of the artesian wells of Calcasieu, and the strange discovery in them of crystalline sulphur beds. We transfer a portion of it to our columns. The chemical contributions of Messrs. CORBIN, WOLLE, and ATWATER, are varied and valuable. Profs. DANA and BRUSH neatly annihilate the *dictum* of the distinguished but not infallible ROSE of Berlin, concerning the magnetite markings in the mica of Pennsbury, Pa. Dr. J. P. KIMBALL furnishes a sketch of the geology of Chihuahua. Dr. E. H. PETERS announces the discovery of a new planet, the 109th asteroid, on the 9th of October last, at the Litchfield Observatory of Hamilton College, Clinton, N. Y. The other articles, and the usual scientific miscellany, are in no way behind the excellent average of this periodical.

WATER runs over Niagara Falls at the rate of 1,500,000,000,000 feet every minute, giving a water power sufficient to perform all the manual labor in the State of New York.

### Ship Canal across Cape Cod.

THE latest canal project is a cut across Cape Cod. A party of wealthy capitalists in Boston have taken the preliminary steps to accomplish this work. They propose to build the canal in nearly a direct line from Buzzard's Bay to Cape Cod Bay, through a narrow neck of land separating those waters, which shall afford a sufficient depth of water to float the largest class of vessels. The canal will be three hundred feet wide, and deep enough to insure twenty-four feet of water at low tide. It is said the persons who propose to achieve this important work are fully prepared to carry it out, and ask for no pecuniary aid.

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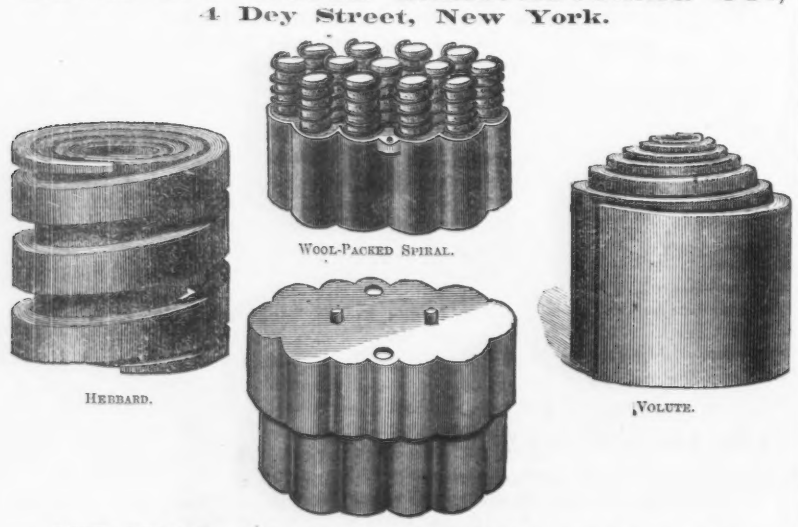

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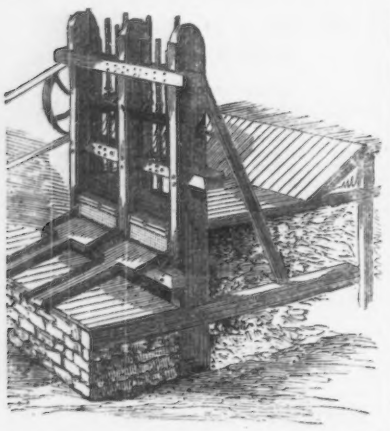

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With Iron or Wood Frames.
*WHEELER & RANDALL'S*
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*CONOIDAL SEPARATOR AND TABULAR CONCENTRATOR,*
With Self-Discharging Quicksilver Apparatus.
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**Concentration by means of Air**

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The *MECHANICAL COMBINATIONS* are extremely simple, the machines therefore correspondingly durable. A continuous self-delivery of ore on one side and tailings on the other is effected, hence very little attention is required except keeping the hopper supplied with ore. The power of one man is sufficient to operate a machine that will concentrate one ton per hour.

*PARTIES INTERESTED IN MINING* are invited to call at No. 210 Eldridge Street, New York, where they may see a machine in operation, and have samples of their own ores crushed and concentrated.

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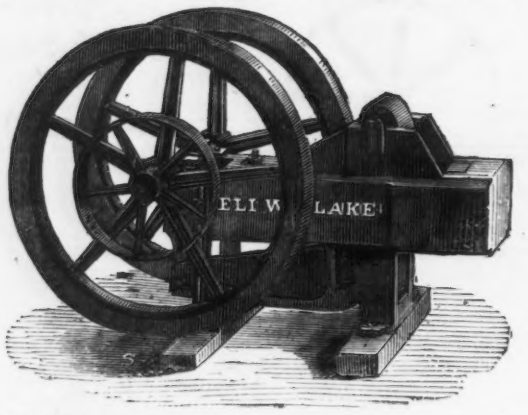


The office of this Machine is to break Ores and Minerals of every kind into small fragments, preparatory to their further comminution by other machinery.

This machine has now been in use, enduring the severest tests, for the last ten years, during which time it has been introduced into almost every country on the globe, and is everywhere received with great and increasing favor as a labor-saving machine of the first order.

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☞ The Patents obtained for this machine in the United States and in England having been fully sustained by the courts, after well contested suits in both countries, all persons are hereby cautioned not to violate them; and they are informed that every machine now in use or offered for sale, not made by us, in which the ores are crushed between upright convergent faces or jaws actuated by a revolving shaft and fly-wheel, are made and used in violation of our patent.

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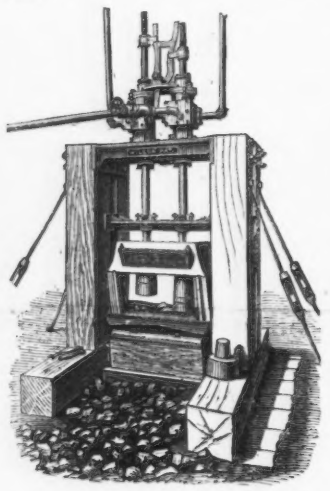
OF PHILADELPHIA, PA.

Are now prepared to supply Miners and other parties with their



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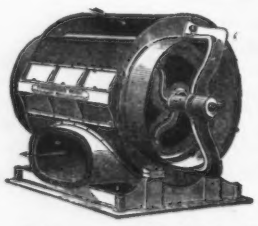

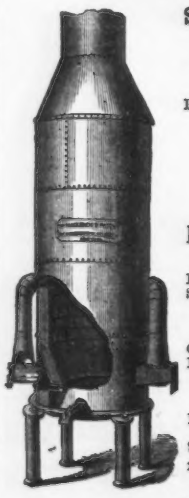

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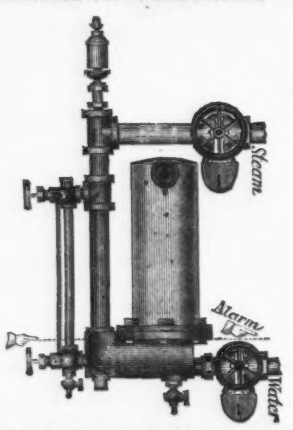


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This Indicator has no equal. It it superior to any Low-Water Indicator in use. In use at the U. S. Mint, Phila.; Treasury Department and Agricultural Department, Washington, and Post Office Philadelphia, and many others. A. F. W. NEYNABER, Gen. Agent,
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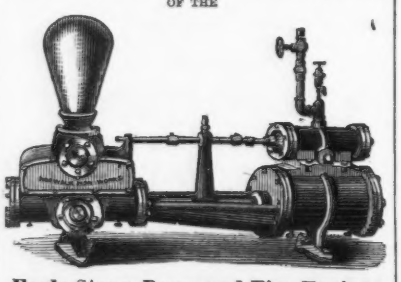

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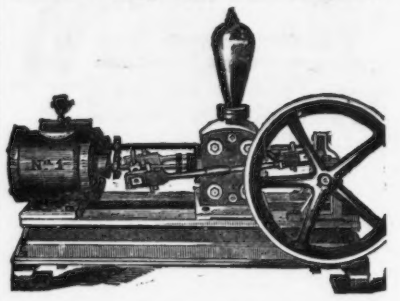

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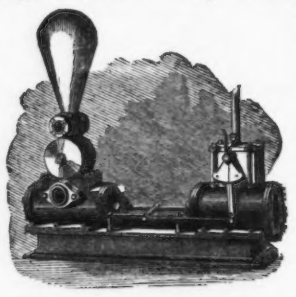

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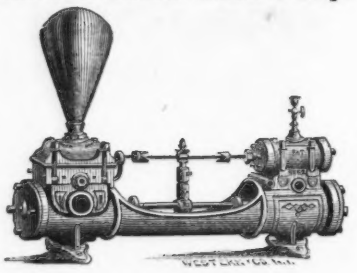

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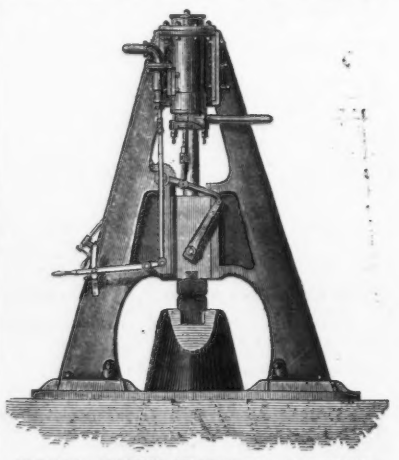

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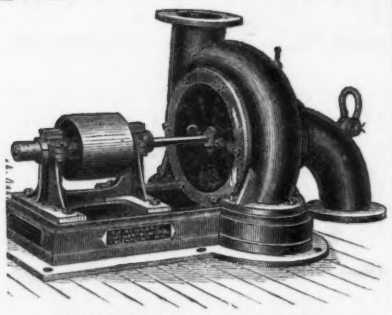

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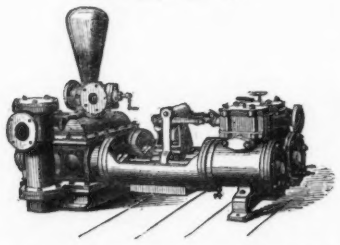

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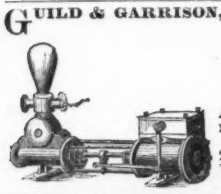

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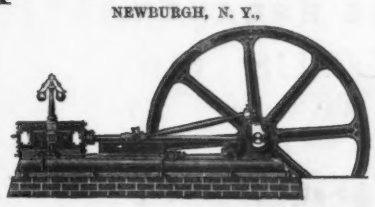

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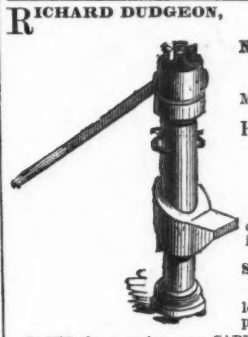

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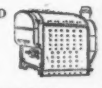

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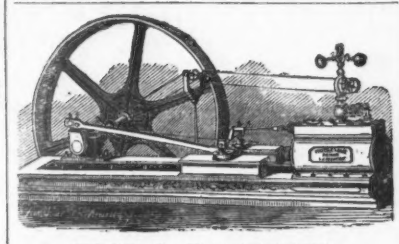

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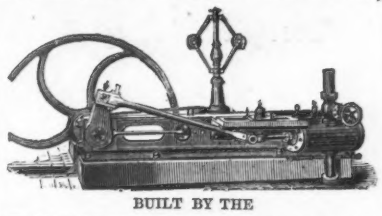

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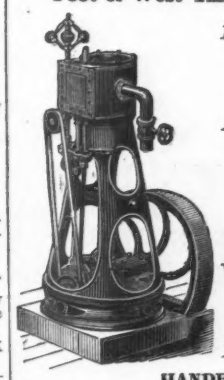

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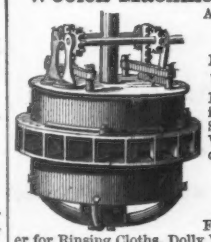

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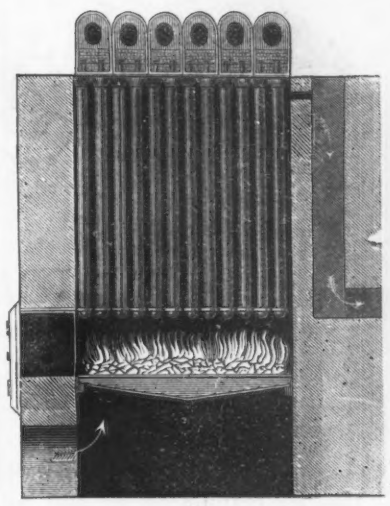

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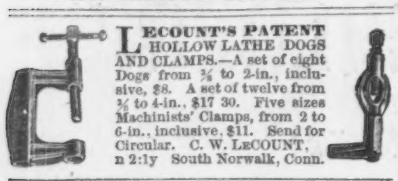

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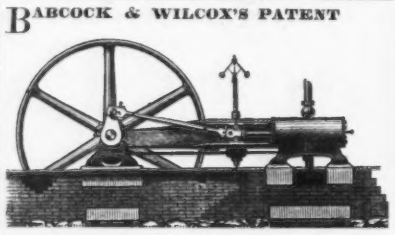

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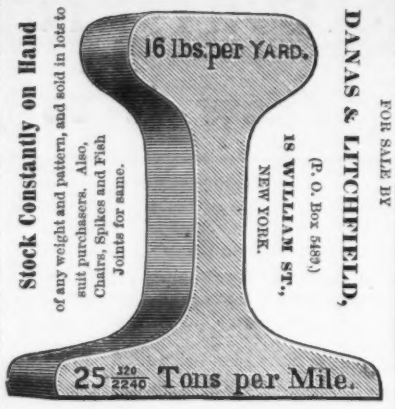


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